Mast and Tower Safety (MATS)
Basic Tower Climbing and Rescue Scheme
Specification

Guidance notes:

1. Each unit contained within this Basic Tower Climbing and Rescue Scheme sets out the knowledge & understanding required by individuals and the practical skills that each individual needs to demonstrate.

2. For the knowledge and understanding learning outcomes, these have been divided into those that are identified as:

    - **Mandatory** (i.e. **30** learning objectives), which must be delivered and assessed within the programme of learning

      and

    - **Optional**. Whilst each of these objectives must be delivered within the programme of learning, you are free to select certain outcomes from each unit for the purposes of assessment. This will ensure that you incorporate at least an additional **15** from 38 optional objectives in your assessment of each individual.

3. Each individual must also be assessed in relation to each of the practical learning objectives shown within each unit, and, therefore, these have been shown as requiring mandatory assessment.

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Unit 1 - Understanding legislation and safety standards

The aim of this unit is to provide learners with the knowledge and understanding of the relevant legislation and rules that apply to working at height in the telecommunications & broadcast industry.

Knowledge & understanding

- All 5 outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
1.1 Know the national legislation relevant to Working at Height.	Main elements of: • Health & Safety at Work Act, 1974 • Work at Height Regulations 2005 • Lifting Operations and Lifting Equipment Regulations (LOLER) 1998	Mandatory
1.2 Know the legislation relevant to equipment inspection.	LOLER 1998 requirements: • Lifting equipment to be thoroughly examined every 12 months • Lifting equipment used for carrying people and lifting accessories like slings, shackles and ropes to be thoroughly examined every 6 months • Equipment and accessories must be inspected in between examinations PUWER 1998 requirements: • Inspection at suitable intervals, where work equipment is exposed to conditions causing deterioration liable to result in dangerous situations The Personal Protective Equipment at Work Regulations 1992 requirements: • Employers must maintain fall arrest equipment and ensure it is in good repair, including replacement when necessary	Mandatory

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	The Work at Height Regulations 2005 requirements: • Equipment should be inspected at suitable intervals and each time after exceptional circumstances which might jeopardise safety have occurred	
1.3 Know the industry medical and fitness requirements for working at height on masts and towers.	Understanding of MATS Guidance GN-005 Medical Requirements for Climbing Masts and Towers, for example: • Medical to be carried out by a medical professional who understands the demands of climbing and activities being undertaken • Medical to be undertaken prior to training or undertaking climbing activities and after any prolonged absence from climbing • Ongoing medicals to be undertaken at periodicity dependent on age • Climbers who feel unwell or are under the influence of drugs or alcohol must not climb	Mandatory
1.4 Know the industry (MATS) agreed rules and expectations for climbing and work at height as detailed in GN-012.	Understanding of agreed rules, for example: • Climbers must be trained in climbing, rescue and Radio Frequency radiation awareness • Other training may be required by certain site owners or customers • A competent person must carry out a risk assessment prior to climbing • At least two competent and equipped climbers must be in attendance during all climbs • Fixed fall arrest systems must be used when in place and serviceable • A climber must be 'attached' to a robust anchor point at all times unless on a protected work platform	Mandatory

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1.5 Know the minimum numbers of climbers and qualified rescuers required in different scenarios and the rationale.	• At least two competent and equipped climbers must be in attendance during all climbs. One climber may remain at ground level but must retain visual contact • For climbs above 120m, a minimum of 3 competent climbers must be in attendance with at least 2 on the structure • For climbs above 120m a maximum distance of 75m between the climbers on the structure at any time • There must be a sufficient number of climbers to identify and respond to an emergency • Climbers must be able to evacuate an injured party to ground level in an appropriate time	Mandatory

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Unit 2 - Assessing risk

The aim of this unit is to provide learners with the knowledge and understanding of how to carry out risk assessments and use safe systems of work relevant to working at height.

Knowledge & understanding

- Outcome 2.5 is mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
2.1 Know the 5 steps required to carry out a risk assessment.	Understanding of risk assessment to include: • The identification of hazards • The potential for harm and the identification of who may be affected • Risk evaluation and the actions required to mitigate risks • The recording of significant findings • The need to review risk assessments and update them as necessary	Optional
2.2 Know the requirements of the work at height hierarchy and how to apply them.	For example, understanding of the Work at Height Regulations 2005 and the need to: • Avoid work at height • Prevent falls by using existing workplace • Prevent falls using collective equipment e.g. MEWPS • Prevent falls using personal protective equipment • Minimise distance using collective equipment airbags etc • Minimise distance using PFPE • Minimise consequences	Optional

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2.3 Know how to plan for a rescue when carrying out a risk assessment.	Understanding of how to plan for a rescue to include the need to: • Ensure a sufficient number of competent persons available to effect rescue • Ensure suitable rescue kits are available considering the height of the structure (numerous kits may be required) • Ensure obstructions on the structure will not prevent rescue from taking place • Ensure location of site is known so details can be passed to emergency services • Ensure adequate mobile phone coverage is available if relied upon for contacting emergency services	Optional
2.4 Know the relevant documentation that must be in place prior to working at height.	Awareness of the need to: • Ensure a permit is in place or permission has been given by the structure owner prior to climbing; the permit may detail specific hazards associated with the structure that need to be considered	Optional
2.5 Know the importance of visual inspection of the structure prior to, and during, work at height activities.	For example, prior to accessing the structure, climbers must: • Ensure the structure has been inspected and is deemed 'safe to climb' by the owner This could be through a STC tag system on the structure or through the structure owners granting of a permit to climb • Ensure that any fixed fall arrest system is in a serviceable condition i.e. it has not been deployed • Ensure that the position to be climbed to is understood before beginning the climb and an attempt as far as practicable, to identify hazards and discuss amongst the team whilst still at ground level For example, whilst climbing the structure, climbers must: • Ensure that steelwork they are going to apply weight to or attach fall arrest or work positioning systems to, is robust enough to take the potential loads	Mandatory

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Unit 3 - Managing common hazards

The aim of this unit is to provide learners with the knowledge and understanding of some of the common hazards and control measures associated with working at height on telecommunications and broadcast masts and towers.

Knowledge & understanding

- Outcomes 3.1, 3.2, 3.3 & 3.4 are mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
3.1 Know the possible effects of falling from height on equipment.	Awareness that the following may occur: • Deployment of shock absorber • Stress on equipment, resulting in the necessity to remove and destroy harnesses, lanyards etc • Stress on structural steelwork etc resulting in potential failure, if insufficient, of anchor points	Mandatory
3.2 Know the control measures that can be put in place to reduce the risk of falling.	Awareness of the need for: • Good climbing technique • Conserving energy during a climb by taking regular breaks • Good physical fitness • Avoidance of use of alcohol, illegal and prescription drugs • Working from within a protected platform where possible • Correct use of a work positioning system when in the work position • Selection of suitable anchor points for fall protection equipment	Mandatory

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3.3 Know the threat from possible falling objects.	For example, an understanding of the following: • The force generated by an object is a function of weight x height x gravitational pull • Even small objects falling from a significant height, can result in fatality • Falling objects can travel a significant distance from the structure • Hard hats provide limited protection against falling objects	Mandatory
3.4 Know the control measures that can be put in place to reduce the hazard from falling objects.	For example, an awareness of the following control measures: • Minimising the objects taken aloft • All tools and equipment must be tethered • Using tool bags with closures or other anti-spill mechanisms • Setting up exclusion zones/drop zones at ground level • Excluding people from areas at ground level which are at significant risk • Ensuring hardhats are worn correctly and within exclusion/ drop zones	Mandatory
3.5 Know the potential hazards from weather and exposure and how to minimise them.	For example, an understanding of the risks of the following: • Hyperthermia in hot conditions; the importance of keeping hydrated so water must be carried aloft. • Hypothermia in cold conditions; ensuring that suitable wet weather gear is used. The need to avoid climbing when a structure has ice on it. • Ensuring climbers are aware of the signs of hypothermia and hyperthermia • Working in windy conditions can increase fatigue and increase the likelihood of falls; ensuring risk assessment considers the conditions and suitable controls (including needing to abort the job) are implemented	Optional

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3.6 Know the possible chemical and biological hazards associated with masts and towers and how to mitigate them.	For example, an understanding of the following: • Lead paint covered structures; climbers can ingest lead if they eat or smoke on the structure • Chromate paint covered structures are a risk if materials are inhaled e.g. if abrading or cutting. Chromate can cause respiratory issues and irritation to skin and eyes. Specific risk assessment to be carried out if chromate dust will be released • Dried bird guano can cause psittacosis if inhaled • The need for climbers to employ good hygiene practices as far as possible and avoid eating and smoking whilst on the structure	Optional
3.7 Know the possible hazards associated with wild birds' nests and how to mitigate them.	For example, an understanding of the following: • The hazards associated with nesting birds due to guano and associated disease e.g. psittacosis and due to aggressive behaviour in certain species • Awareness of Wildlife and Countryside Act requirements around the 'disturbance' of birds' nests and nesting birds • The need to withdraw from a climb if a nest is identified	Optional
3.8 Know other common hazards associated with working at height and how to mitigate them.	For example, an understanding of the following: • Radio frequency radiation; ensuring that permits are in place and RF monitors are worn • Dropped objects; tether tools, setting up exclusion zones, ensuring lifting equipment suitable and sufficient	Optional

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Unit 4 - Using harnesses

The aim of this unit is to provide learners with the knowledge, understanding and the practical skills required of the selection, inspection, fitting and use of harnesses and how to store, clean and maintain them after use.

Knowledge & understanding

- Please select 1 optional outcome for assessment for this unit.

Learning outcomes	Knowledge & understanding	Assessment
4.1 Know the industry guidance on the frequency and type of inspection required of personal fall protection equipment.	An awareness of the following: • Lanyards should be subject to pre-use checks, detailed inspections, and interim inspections • Employer's inspection frequency regime. Industry 'accepted' frequency is a minimum of 6 monthly • It is essential that the person carrying out any inspection is sufficiently independent and impartial to allow them to make objective decisions and has appropriate authority to discard defective equipment	Optional
4.2 Know the content of documentation that should accompany a harness and other fall protection equipment.	For example, documentation should include: • Certificate of conformity including the standards to which the harness adheres • equipment serial number • date of manufacture • manufacturer's user instructions • manufacturer's recommendations for replacement	Optional

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4.3 Know how to store, clean and maintain climbing harnesses**.**	For example: • Storage in a clean, dry place away from direct sunlight • Storage away from equipment which could damage harness, e.g. when in transit • Do not use a drying room to dry webbing products • Do not stand on a harness when donning/removing • Do not use marker pens or solvents • Clean in line with manufacturer's instructions	Optional

Practical skills

- All outcomes are mandatory and must be assess for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
4.4 Demonstrate how to inspect harnesses and fall protection equipment for safe use in line with guidance.	An understanding of the need to check for and remove harnesses or equipment from use if any of the following are found: • Cuts of 1 mm or more at the edges of webbing • Surface abrasion across the face of the webbing and at the webbing loops, particularly if localised • Abrasion at the edges, particularly if localised • Damage to stitching e.g. cuts or abrasion • Knots in lanyards, other than those intended by the manufacturer • Evidence of chemical attack often indicated by flaking of the surface. There may also be a change to the colour of the fibres • Heat or friction damage indicated by fibres with a glazed appearance which may feel harder than surrounding fibres	Mandatory

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	• Evidence of UV-degradation which is difficult to identify, particularly visually, but there may be some loss of colour, if dyed and a powdery surface • Partially deployed energy absorber e.g. short pull-out of tear webbing • contamination e.g. with dirt, grit, or sand which may result in internal or external abrasion • Damaged or deformed fittings e.g. karabiners, screw link connectors, scaffold hooks • Damage to the sheath and core of a kernmantle rope e.g. rucking of the core detected during tactile inspection • Rusting or pitting of metal work e.g. D-rings	
4.5 Demonstrate how to correctly fit a harness in line with manufacturer's instructions and/or industry guidance.	For example, the need to: • Ensure D-ring is situated halfway between the shoulder blades • Ensure harness is correct 'tightness'. For example, for leg straps you should be able to fit a flat hand between the strap and the wearer's leg, but not a fist • Ensure chest straps are adjusted so that the front d ring is at the sternum • Ensure straps are not twisted • Carry out a 'buddy' check to ensure harness is correctly fitted and adjusted	Mandatory

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Unit 5 - Using fall arrest lanyards

The aim of this unit is to provide the learner with the knowledge, understanding and practical skills of using fall arrest lanyards and how to conduct a user inspection.

Knowledge & understanding

- Outcome 5.5 is mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
5.1 Know the legal requirements affecting the use of fall arrest lanyards when working at height.	An awareness that: • Fall arrest lanyards must be used in line with manufacturer's instructions • Fall arrest lanyards must be used if other options have been exhausted and climbers are in a position where they could still fall • Fall arrest lanyards must be regularly inspected e.g. in line with manufacturer's instructions and document INDG367	Optional
5.2 Know how to identify if PFPE has been involved in a fall incident.	Signs such as: • Partially deployed energy absorber e.g. short pull-out of tear webbing • Deformed or damaged karabiner or maillon	Optional
5.3. Know the difference between a twin fall arrest lanyard and a single fall arrest lanyard.	For example: • Single fall arrest lanyards each have their own energy absorber device; twin fall arrest lanyards have one energy absorber pack • If using twin fall arrest lanyard care must be taken not to render the energy absorber ineffective by ensuring fall arrest lanyard hooks are always	Optional

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	‘parked’ and not attached to the harness when the other is in use. Sacrificial “parking” loops can be used • If single lanyards are used and both are attached when a fall occurs, the fall applied to the user can be doubled, as energy absorbers may not deploy	
5.4 Know how to conduct a user inspection, in line with manufacturer’s instructions.	For example, check for and remove, if any of the following is found: • Cuts of 1 mm or more at the edges of webbing • Surface abrasion across the face of the webbing and at the webbing loops, particularly if localised • Abrasion at the edges, particularly if localised • Damage to stitching (e.g. cuts or abrasion) • Knots in lanyards, other than those intended by the manufacturer • Chemical attack often indicated by flaking of the surface. There may also be a change to the colour of the fibres • Heat or friction damage indicated by fibres with a glazed appearance which may feel harder than surrounding fibres • UV-degradation which is difficult to identify, particularly visually, but there may be some loss of colour (if dyed) and a powdery surface • Partially deployed energy absorber e.g. short pull-out of tear webbing • Contamination e.g. with dirt, grit, sand which may result in internal or external abrasion • Damaged or deformed fittings e.g. karabiners, screw link connectors, scaffold hooks • Damage to the sheath and core of a kernmantle rope e.g. rucking of the core detected during tactile inspection	Optional

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5.5 Know how to take fall factors and minimum clearance distances into account when using lanyards.	• The fall factor varies between 0,1 and 2
	• The fall factor is the ratio between the height of the fall and the length of rope that is available to absorb that fall
	• The lower the value of the fall factor, the less impact forces are applied to the body of the person and the 'safer' the fall
	• Instructors must give details of calculation: fall factor= height of fall/length of lanyard
	• Minimum clearance distance examples are given in BS8437:2005. Code of practice for selection, use and maintenance of personal fall protection systems
	• Clearance distance required is a function of:
	  · length of energy absorbing lanyard
	  · deployment distance
	  · height of faller
	  · safety distance 1m
		Mandatory

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
5.6 Demonstrate how to correctly attach fall arrest systems to a harness.	• The use of front and rear attachment points • The use of a maillon as a connector, or if a karabiner, why a triple action karabiner is preferable	Mandatory
5.7 Demonstrate how to correctly apply lanyard hooks.	• The use of the correct method for ensuring that the hook is properly engaged • The application of hooks so as not to incur forces that they are not designed to take such as side loadings	Mandatory

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	• Minimising the angle between lanyards e.g. when both in use, to minimise forces	
5.8 Demonstrate how to park double lanyard hooks so as not to bypass the absorber device.	• Use of sacrificial “parking” loops	Mandatory
5.9 Demonstrate how to apply hooks at a suitable height to minimise fall factors.	• Hooks should be placed as high as reasonably possible to minimise fall factors • Hooks should be placed on ‘horizontal’ steelwork where possible to prevent the hook from falling to a lower position	Mandatory
5.10 Demonstrate how to use fall arrest lanyards appropriately when the steelwork is too large for lanyard hooks.	For example: • Choking back onto lanyard only when an approved and appropriate choking ring is provided • Use of fixing strops etc around fixed structural anchors • Using retractable lines etc when necessary • Anchor point slings (to EN795) can be used to attach to	Mandatory

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Unit 6 - Selecting appropriate anchor points

The aim of this unit is to provide learners with the knowledge, understanding and practical skills of safe anchor point selection.

Knowledge & understanding

- All 3 outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
6.1 Know how to select an anchor point which can take the loads that will be applied to it.	For example: • Fall arrest safety anchor eye bolts • Structural anchors such as large steel beams on site • Formal anchors which are marked with an inspection date • EN795 Class A1: Structural anchorages designed to be secured to vertical, horizontal and inclined surfaces	Mandatory
6.2 Know the type of anchor points which would be unsafe.	For example: • Antenna mounting bracketry • Anti-climb devices • Grillage platforms • Platform handrails • Feeder or cable brackets	Mandatory
6.3 Know the different places that anchor points can be situated.	For example: • Structural steelwork etc which can take the likely loads imposed by a fall, e.g. BS EN 795:2012 gives 12kN as the static strength an anchor must be able to take	Mandatory

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Practical skills

- This outcome is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
6.4 Demonstrate how to protect lanyards, slings and rescue ropes from sharp edges.	For example: • Ensuring that the rescue rope never goes directly over a sharp edge • The range of protective equipment available such as simple rope covers and edge mats to intricate roller devices • Ensuring that the edge protector does not hinder the rope movement but provides a barrier between the rope and edge • Ensuring that the edge protector is secure at the edge to prevent it slipping away • Monitoring the edge protector as it is a point of potential failure	Mandatory

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Unit 7 - Using fixed fall arrest systems

The aim of this unit is to provide learners with knowledge and understanding of the different types of vertical fall arrest systems and how to inspect, use, clean, store and maintain them.

Knowledge & understanding

- Outcomes 7.2 and 7.3 are mandatory and must be assessed for this unit.
- Please select 1 optional outcome to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
7.1 Know the legal requirements affecting the use of fixed fall arrest systems when working at height.	An understanding that: • If a fixed system is fitted it should be used and the climber should have assurance that the system has been inspected and is serviceable. • If a fixed system is used such as a wire system or rail system, British standards apply that detail install standards, training for all persons in the use of the system and inspection frequencies • Only system compatible kit should be used, and the load capacity of the system should be marked on the system and followed • The system must always be marked with an inspection date	Optional
7.2 Know how the hierarchical approach applies to fixed fall arrest systems when working at height.	• Where a fixed fall arrest system is installed it must be used • Use of fixed fall arrest systems minimise the distance and consequences of falls from height more effectively than the use of lanyards	Mandatory

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7.3 Know how and when to inspect trolleys and fixed systems.	For example: • The need to have assurance that the system has been inspected and is serviceable before use • Use visual aids where available e.g. spinning disc on a Latchways wire system • The need to check for visual damage after use • A formal inspection on a six-monthly basis and the system itself, annual inspection. Both should be recorded	Mandatory
7.4 Know how to store, clean and maintain fall arrest systems.	For example: • Keeping the gear in good order is vital • Equipment must be dried out and cleaned if contaminated, and then re-inspected before storing • Manufacturer's instructions should always be followed • Advice can be obtained from a PFPE inspector or through a specialist contracted company • The required formal inspections at 6 monthly and 12 monthly intervals should be noted and followed	Optional

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Practical skills

- This outcome is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
7.5 Demonstrate how to use different types of fixed fall arrest systems safely and correctly.	For example: • Systems such as Latchways, Glideloc, Railok and Metreel all work on the same principle of secure attachment to them with smooth movement of the travelling / attachment device whilst attached • Understanding how to attach at a place of safety and be familiar with the operation of the system / traveller • Understanding of attachment and detachment • Awareness of the limitations of devices • Ensuring that the attachment device is secured properly to the fixed system before leaving the place of safety	Mandatory

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Unit 8 - Using work positioning lanyards

The aim of this unit is to provide learners with the knowledge, understanding and practical skills of how to use work positioning lanyards safely.

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
8.1 Demonstrate how to attach a lanyard correctly to a ladder or steelwork system.	• Awareness that if a work positioning lanyard is being used the user should be backed up with a fall arrest device • Lanyards should be used in conjunction with a fall arrest harness to provide additional support to the user, allowing them to work more comfortably and safely in order to leave hands free for work • A work positioning lanyard has no shock absorbing properties, it is not a fall arrest lanyard and must not be used for this purpose • All pole straps can be adjusted to pass around the support structure and to accommodate different size users, keeping the person working at height comfortable and safe	Mandatory
8.2 Demonstrate how to lean back and trust the work positioning lanyard leaving hands-free.	• Using the lanyard to free up hands for work	Mandatory
8.3 Demonstrate how a fall arrest system is used in addition to the work positioning lanyard.	• The fall arrest system is the protection device. The positioning device assists and makes the user comfortable and secure whilst working	Mandatory

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8.4 Demonstrate how to attach a work positioning lanyard correctly to the harness.	• The work positioning lanyard is normally attached to the EN358 D rings on the side waist area with the rope going around the structure and attaching to the other side. • There is an adjusting device to lengthen the rope and karabiners/ snap hook on the end to secure into the harness D ring	Mandatory
8.5 Demonstrate how to inspect work positioning lanyard equipment.	• Before and after every use • The need to check that it is free from cuts and abrasions and contamination • The need to check that all mechanical parts working and not bent or damaged	Mandatory

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Unit 9 - Using additional fall prevention equipment

The aim of this unit is to provide learners with the knowledge and skills to use the additional PFPE necessary to access some parts of masts and towers.

Knowledge & understanding

- Outcomes 9.1 and 9.2 are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
9.1 Know when and where additional fall protection equipment will be required for safe working at height.	For example: • Fall protection equipment like retractable lines, drop-lines and slide-chucks may be required when climbing down the face of a large structure (where steelwork is too large to apply a lanyard hook) or where the use of such equipment would minimise the risk from human error as lanyards can be incorrectly applied etc. • On large towers where there are long horizontal beams between legs, a tensioned horizontal line may be required to provide an anchor point when traversing between legs	Mandatory
9.2 Know how to inspect additional fall protection equipment and identify any safety issues before use.	• The need to refer to user manuals and ensure that individuals involved are suitably aware and trained in how to use the equipment • The importance of checking equipment before and after using it • An understanding of the correct operation of equipment to enable proper inspection • An understanding of what not do with the device	Mandatory

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Practical skills

- This outcome is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
9.3 Demonstrate how to safely use a range of equipment.	The user must be fully aware of how to operate equipment and understand the safety features, limitations of the equipment, inspection requirements and training requirements if applicable. For example: • Retractable line systems (angles of operation) • Drop lines • Tensioned horizontal lines	Mandatory

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Unit 10 - Developing rescue plans

The aim of this unit is to provide learners with the knowledge and understanding of the need for an effective rescue plan for any work at height on masts and towers and an awareness of some of the issues to consider when developing plans.

Knowledge & understanding

- Outcomes 10.1, 10.3 and 10.7 are mandatory and must be assessed for this unit.
- Please select 1 optional outcome to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
10.1 Know the importance of having detailed knowledge of the site where work is taking place.	For example: • Awareness that pre-planning is vital to ensure that a rescue plan can be thought through in terms of the required rescue kit and / or equipment • The precise address reference, which may be remote, should be recorded as this may vital for the emergency services • Access to the site for emergency vehicles should be recorded and planned for	Mandatory
10.2 Know the potential pitfalls associated with reliance on post codes.	For example: • In rural areas post codes are vast, plans need to be made as to direct an ambulance or emergency service vehicle. Where possible, a street name should be included	Optional
10.3 Know the level of competence of others who may need to participate in a rescue.	For example: • At least one competent person is needed to rescue another person • Everyone should be familiar with the on-site rescue kit and acquainted with the emergency arrangements in place • In a two-person team, both should be competent First Aiders	Mandatory

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	• The rescue plan should include if particular technical expertise is needed to access the site. If so, a minimum of two individuals in the rescue team need to have the specific skills required	
10.4 Know the importance of the ability to communicate appropriately in rescue situations.	Understanding that: Climbers must maintain visual contact with each other. If in a two-person team and one person is at ground level, that person must retain visual contact e.g. must not leave the site or work within a building with no visibility of the person on the structure. A range of communication methods may be used, for example: • Mobile phones • 2-way radios • Loud speakers • Hand signals It is essential that climbers can communicate with each other at all times.	Optional
10.5 Know the types of rescue situations when radio communications may need to be used.	For example: • A radio system may be essential when working on a large structure when wind noise would make it impossible to communicate normally • During a rescue from significant height the drop line may be required to be pulled at a certain angle to assist the rescue with moving the casualty away from part of the structure • Use of a pilot line system • Additionally, the rescuer may be stabilising the casualty at height and speaking via radio to other team members on the ground or even a paramedic who may be on route	Optional

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10.6 Know the importance of having suitably trained First Aiders in attendance when people are working at height.	Awareness that: • The first few minutes can be vital to stabilise an injured person. It can be a matter of life or death • The casualty may not be able to be moved to the ground and could be unconscious. The first aider must act quickly to secure the casualty in a position that avoids suspension syncope developing • The site could be remote and the person working alongside the injured party may be the only person immediately able to help	Optional
10.7 Know the reasons why all potential rescuers need to be familiar with the specific rescue equipment provided.	For example: • A rescue needs to be effectively time controlled to reduce the need for the rescuer to need rescuing • Allows the rescuer to focus on the rescue and injured party	Mandatory
10.8 Know the importance of having a suitably equipped rescue kit readily available.	For example: • A rescue needs to be effectively time controlled to reduce the casualty from suffering from further issues • The rescue kit should be ready to use as this saves those vital seconds and allows the rescuer to focus on the injured party	Optional

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Unit 11 - Inspecting rescue equipment

The aim of this unit is to provide learners with the knowledge and understanding of the need to inspect rescue equipment and identify common issues.

Knowledge & understanding

- Outcomes 11.3 and 11.4 are mandatory and must be assessed for this unit.
- Please select 1 optional outcome to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
11.1 Know the importance of record keeping when carrying out inspections.	For example: • A legal requirement • Allows for effective audit programmes to be in place • In the event of an incident evidence can be produced regarding the kit maintenance history • The user can be shown that the kit has been maintained in good order • It ensures that it is actually checked	Optional
11.2 Know why rescue kit components should not be used for other activities.	For example: • Items may not be returned to the rescue kit after use if borrowed • Damaged items, this could cause the whole rescue kit to be useless • Rescue kit should be in peak condition as new if possible • The kit may be dirty from the last use and not working effectively	Optional

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11.3 Know the range of different inspection methods.	An awareness that rescue kits range in complexity. For example: • Functional test • Some kits may be able to be inspected by competent individuals within an organisation • Others may only be able to be inspected by authorised inspection companies or even the manufacturer themselves • There are informal and formal inspections, and these can be visual, tactile or even intrusive where parts need to be replaced	Mandatory
11.4 Know the common inspection issues.	For example: • Dirt and grit contamination • Rope wear, pulley damage, stretching of ropes • Often the rope or wire system will be retracted, and damage is not visible unless the system is fully drawn out • Damage to dropped objects may only show as fine cracks but these need to be considered carefully • UV damage may only show as slight fading but can severely weaken the fabric	Mandatory

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Unit 12 - Managing suspension syncope

The aim of this unit is to provide learners with knowledge of the causes and symptoms of suspension syncope, how to minimise its effects and the importance of a quick response when somebody is suspended in a harness.

Knowledge & understanding

- Outcomes 12.2, 12.3, 12.5 and 12.7 are mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
12.1 Know the causes of suspension syncope.	An understanding that: • The term “suspension syncope” is used to describe the situation of a person falling into suspension in a harness and then becoming unconscious • Loss of consciousness is not due to any physical injury, but orthostasis, motionless vertical suspension, is responsible • “Syncope” is the sudden transient loss of consciousness with spontaneous recovery, as may occur with a simple faint." - HSE 2008 • If an injured party is unable to use or move their legs, they will eventually faint as blood collects in the legs and is not returned to the rest of the body especially the brain • Normally when someone faints they will fall over, and blood will rush back to the brain. If a person is prevented from falling blood does not return to the brain	Optional
12.2 Know the symptoms of suspension syncope.	An understanding that: • Typical symptoms include pallor, sweating, shortness of breath, blurred vision, dizziness, nausea, hypotension and numbness of the legs • Suspension syncope eventually leads to fainting, which may result in death due to oxygen deprivation of the brain	Mandatory

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12.3 Know how to minimise fall factors.	• Lanyard attachment to be correctly positioned above the person whenever possible • Use of the shortest length lanyard possible that allows the job to be performed.	Mandatory
12.4 Know the factors which ensure a good fitting climbing harness.	For example: • Correct training in putting it on • The harness should be adjustable • Flexible fabrics • The harness should be the correct size for the individual	Optional
12.5 Know the techniques that can be used to alleviate the onset of suspension syncope.	For example • If someone is stranded in a harness, but is not unconscious or injured, and has something to kick against or stand on (such as a ledge or leg-loops) it is helpful for them to use their leg muscles by pushing against it every so often, to keep the blood pumping back to the torso • If the person is stranded in mid-air or is exhausted, then keeping the legs moving can be both beneficial and rather dangerous. On the one hand, exercising the leg muscles will keep the blood returning to the torso, but on the other hand, as the movements become weaker the leg muscles will continue to demand blood yet they will become much less effective at returning it to the body, and the moment the victim ceases moving their legs, the blood will immediately start to pool • If it is impossible to rescue someone immediately, then it is necessary to raise their legs to a sitting position, which can be done with a loop of rigging tape behind the knees or specialized equipment from a rescue kit	Mandatory
12.6 Know the temporary aids which can be used to alleviate the onset of suspension syncope.	For example: • Leg straps can be used to allow the legs to raised and supported • Many other simple leg raise devices exist	Optional

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12.7 Know how to position a casualty correctly when they are evacuated to ground level.	For a semi-conscious, unconscious or conscious casualty, the usual rules of ABC and placement in the recovery position apply.	Mandatory
12.8 Know how to provide care for a casualty after rescue.	After a casualty has been rescued, there are very specific post-rescue care instructions that need to be followed. For example: • Once blood can flow freely throughout the casualty's body again, there is at risk of suffering from Reflow Syndrome. Reflow Syndrome is, "the return of pooled, hypoxic blood with metabolic by-products from the extremities to the heart." • If blood cannot circulate throughout the body, it begins to accumulate carbon dioxide and other bodily waste products that can be dangerous for the human body to process in large amounts. When blood is full of carbon dioxide and other metabolic waste, the heart and other organs are at risk of failure • In this situation a KED board can still be used if there are any potential spinal injuries which need stabilization before transport • The importance of preventing a casualty from lying flat or standing upright immediately after a rescue where suspension syncope is a possibility • An awareness that if a casualty's body is in a straight line, all the toxic blood can rush right back into the body and cause organ failure and/or brain damage due to a lack of oxygen and the presence of waste materials	Optional
12.9 Know how to handover a casualty to a first aider or emergency services.	For example: • It is important to inform the First Aider or emergency services that the person may have suffered from suspension syncope • Inform them of any known medical issues • Inform them if the injured person lost consciousness and estimate how long they were in this state • Inform them how long the casualty may have been hanging • Provide the casualty's personal details	Optional

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12.10 Know the risk factors for potential venous pooling.	• Fainting or collapsing • Heart failure in extreme cases	Optional
12.11 Know how to prevent venous pooling.	• Leg raising • Pumping legs against a fixed surface or pushing against a loop of webbing or rope	Optional

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Unit 13 - Selecting rescue techniques

The aim of this unit is to provide learners with an understanding of the importance of personal safety when carrying out a rescue, and the knowledge to ensure that they select the appropriate rescue technique in accordance with a hierarchy.

Knowledge & understanding

- Outcome 13.2 is mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
13.1 Know how to minimise risks to personal safety in a rescue situation.	For example: • Apply good practice • Do not repeat the original error • Involve extra people if possible	Optional
13.2 Know the general rescue hierarchy.	For example, as described in Section 5 GN008: • Self-rescue • Stretcher rescue • Remote rescue/assisted lower • 'Snatch' rescue	Mandatory
13.3 Know the circumstances in which a casualty may be self-rescued with the possible assistance of a rescuer.	For example: • The person is conscious • The person can be easily lowered • The person can still be attached to move to a safe place	Optional

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13.4 Know when the remote lowering of a casualty by a rescuer may be appropriate.	For example: • When it is a straight drop or easy drop • The correct rescue device is available	Optional
13.5 Know when a “snatch” or “pick off” rescue of a casualty may be appropriate.	For example: • When the casualty needs assistance to manoeuvre past obstacles and other climbers are not available to assist in a remote lower • Where the rescuer needs to abseil down to a position to attach the casualty • Where descent device has adequate capacity	Optional
13.6 Know the role of the emergency services in relation to industrial rescue.	• The primary role of a fire and rescue authority in an emergency is to extinguish any fire and rescue anyone trapped by fire, wreckage or debris • They will prevent further escalation of an incident by controlling or extinguishing fires, rescuing people, and undertaking other protective measures • They will work with organisations to plan for rescues, but this is region dependant	Optional

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Unit 14 - Using knots and “off-weighting” techniques

The aim of this unit is to provide learners with the knowledge and understanding of the different type of knots and their use, using appropriate “off-weighting” techniques and how to minimise the risks associated with the use of knives in rescue scenarios.

Knowledge & understanding

- Outcome 14.2 is mandatory and must be assessed for this unit.
- Please select 1 optional outcome to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
14.1 Know the different type of knots used, the appropriate circumstances for their use and how to tie them ready for use.	An understanding of which knots are appropriate in different circumstances A minimum of: • Figure of eight • Clove hitch • Stopper • Bowline	Optional
14.2 Know the reasons for using “off-weighting” techniques when transferring a suspended casualty.	For example: • Speeds up the process • Prevents manual handling injuries • Provides mechanical advantage • Minimises personal error and cutting of the ‘wrong’ rope • Reducing any further shock loading to a structural anchor that may have been compromised by the fall	Mandatory

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14.3 Know the risks associated with using knives or other cutting implements in a rescue situation.	An awareness that a rescue situation is stressful, and mistakes can easily be made, for example: • Knives can cut the wrong rope etc • Sudden loading of personal fall protection equipment and the rope can lead to damage and further injury	Optional

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Unit 15 - Demonstrating climbing techniques

The aim of this unit is to provide learners with the knowledge, understanding and practical skills needed to be able to demonstrate safe climbing and working at height techniques.

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
15.1 Demonstrate the establishment of an appropriate exclusion zone/drop zone.	For example: • Understanding the size requirements of setting up drop zones at ground level • Preventing unauthorised persons from accessing	Mandatory
15.2 Demonstrate how to attach to fixed fall systems correctly.	For example: • Checking fall-arrest trolley is compatible • Checking fixed fall arrest system is serviceable before use • Correct use of attachment points e.g. to front D ring • Testing that the device ‘engages’ before use • Awareness of potential errors	Mandatory
15.3 Demonstrate the correct use of fixed fall systems.	For example: • Correct application ensuring trolley is properly engaged on rail or rope • Demonstrate what action to take if trolley ‘snags’ • Not ‘weighting’ system by using it for rest etc • Pre-use inspection • Attachment points	Mandatory

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15.4 Demonstrate a fluid climbing technique on the ladder with climbing hooks.	For example: • Maintaining permanent attachment, to the rungs and not the styles (unless aluminium or GRP ladder used, in which case the instructor will have to talk through the relative benefits of attaching to the stiles) • Lanyard hooks placed above head height where possible, and the secondary attachments at a point in relationship to the body versus the fall distance. Not allowing forces to be greater than 6kn max if the primary was to fail • Minimising fatigue by taking frequent rests	Mandatory
15.5 Demonstrate an ability to move around the external face of a structure whilst attached.	For example: • Maintaining permanent attachment to at least one anchor point	Mandatory
15.6 Demonstrate the ability to put full weight on the work positioning system.	For example: • Choking back only when an approved and appropriate choking ring is provided	Mandatory
15.7 Demonstrate confidence when working and moving at height.	• Using appropriate speed • Behaving with appropriate calmness	Mandatory
15.8 Demonstrate how to safely **ascend** away from the ladder whilst maintaining permanent attachment.	For example: • Using retractable lines or drop lines appropriately • Using lanyards appropriately	Mandatory
15.9 Demonstrate how to safely **descend** away from the ladder whilst maintaining permanent attachment.	For example: • Using retractable lines or drop lines appropriately • Using lanyards appropriately	Mandatory

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15.10 Demonstrate how to safely maintain permanent attachment when moving around and working.	For example: • Ability to work around antennas, frames, feeders and ancillary equipment	Mandatory
15.11 Demonstrate how to consistently select robust anchor points.	• Ability to identify good and bad anchor points	Mandatory
15.12 Demonstrate how to use fall protection equipment appropriately when the steelwork is too large for lanyard hooks.	• Choking back onto lanyard only when tested eyes provided • Use of fixing strops etc around fixed structural anchors • Using retractable lines etc when necessary • Anchor point slings (to EN795) can be used to attach to	Mandatory
15.13 Demonstrate the appropriate use of knots.	• Use of the appropriate knots in different circumstances A minimum of: • Figure of eight • Clove hitch • Stopper • Bowline	Mandatory

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Unit 16 – Carrying out a rescue

The aim of this unit is to provide learners with the knowledge, understanding and practical skills needed to be able to demonstrate carrying out a rescue when working at height.

Knowledge & understanding

- Outcome 16.1 is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
16.1 Know how to use a tensioned pilot wire for bringing the casualty out and away from the structure.	• Where structure is congested there may be a need to bring casualty out and down a pilot • Pilot can be made up by terminating a rescue rope to the structure and tensioning it with the assistance of an ascender or other cammed device e.g. Petzl ID • Deviation of the casualty can be made by putting a pulley on the pilot rope and attaching this through karabiner to the casualty	Mandatory

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
16.2 Demonstrate self-rescue	For example: • Configure the descent device for abseil • Add additional friction to rope if required to ensure controlled descent • Operate descent device in a controlled manner to ensure steady descent	Mandatory

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	• Use legs to avoid obstructions (do not use hands unless stationary and device locked off) • 'Lock' device when stationary to avoid uncontrolled descent	
16.3 Demonstrate how to remotely lower a casualty.	For example: • When it is a straight drop or easy drop • The correct rescue device is available and used	Mandatory
16.4 Demonstrate a 'snatch' or 'pick-off' rescue of a casualty.	For example: • Knowledge of descent or rescue device, capacity and harness capacity etc • It may be a last resort • The casualty is unconscious • Immediate first aid is required	Mandatory
16.5 Demonstrate using an appropriate off-weighting system to remove the casualty from the fall arrest device.	For example: • The "Petzl cracker" system	Mandatory
16.6 Demonstrate how to tie a range of knots.	A minimum of: • Figure of eight • Clove hitch • Stopper • Bowline	Mandatory

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Mast and Tower Safety (MATS)

Basic Tower Climbing and Rescue Scheme – Renewal Specification

Guidance notes:

1. Each unit contained within this Basic Tower Climbing and Rescue Scheme – Renewal sets out the knowledge & understanding required by individuals and the practical skills that each individual needs to demonstrate.

2. For the knowledge and understanding learning outcomes, these have been divided into those that are identified as:

    - **Mandatory** (ie **15** learning objectives), which must be delivered and assessed within the programme of learning

      and

    - **Optional**. Whilst each of these objectives must be delivered within the programme of learning, you are free to select certain outcomes from each unit for the purposes of assessment. This will ensure that you incorporate at least an additional **5** from 17 optional objectives in your assessment of each individual.

3. Each individual must also be assessed in relation to each of the practical learning objectives shown within each unit, and, therefore, these have been shown as requiring mandatory assessment.

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Unit R1 - Understanding legislation and safety standards

The aim of this unit is to assess the learner's knowledge and understanding of legislation, safety standards and the medical and fitness levels required for working at height.

Knowledge & understanding

- Outcomes R1.1 and R1.2 are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R1.1 Know the national legislation relevant to Working at Height.	Main elements of: • Health & Safety at Work Act, 1974 • Work at Height Regulations 2005 • Lifting Operations and Lifting Equipment Regulations (LOLER) 1998	Mandatory
R1.2 Know the industry medical and fitness requirements for working at height on masts and towers.	Understanding of MATS Guidance GN-005 Medical Requirements for Climbing Masts and Towers, for example: • Medical to be carried out by a medical professional who understands the demands of climbing and activities being undertaken • Medical to be undertaken prior to training or undertaking climbing activities and after any prolonged absence from climbing • Ongoing medicals to be undertaken at periodicity dependent on age • Climbers who feel unwell or are under the influence of drugs or alcohol must not climb	Mandatory

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Unit R2: Inspecting and fitting Personal Fall Protection Equipment (PFPE)

The aim of this unit is to assess the learner's knowledge of the requirement for pre-use inspection and the practical skills of identifying defects in, and correct fitting of, PFPE.

Knowledge & understanding

- Outcome R2.1 is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R2.1 Know how to inspect PFPE for any defects.	Harnesses, fall-arrest lanyards, work positioning lanyards For example: • Lanyards should be subject to pre-use checks, detailed inspections, and interim inspections • Employer's inspection frequency regime. Industry 'accepted' frequency is a minimum of 6 monthly • It is essential that the person carrying out any inspection is sufficiently independent and impartial to allow them to make objective decisions and has appropriate authority to discard defective equipment	Mandatory

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Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R2.2 Identify defects in a range of PFPE.	An understanding of the need to check for and remove harnesses or equipment from use if any of the following are found: • Cuts of 1 mm or more at the edges of webbing • Surface abrasion across the face of the webbing and at the webbing loops, particularly if localised • Abrasion at the edges, particularly if localised • Damage to stitching e.g. cuts or abrasion • Knots in lanyards, other than those intended by the manufacturer • Evidence of chemical attack often indicated by flaking of the surface. There may also be a change to the colour of the fibres • Heat or friction damage indicated by fibres with a glazed appearance which may feel harder than surrounding fibres • Evidence of UV-degradation which is difficult to identify, particularly visually, but there may be some loss of colour, if dyed and a powdery surface • Partially deployed energy absorber e.g. short pull-out of tear webbing • contamination e.g. with dirt, grit, or sand which may result in internal or external abrasion • Damaged or deformed fittings e.g. karabiners, screw link connectors, scaffold hooks. • Damage to the sheath and core of a kernmantle rope e.g. rucking of the core detected during tactile inspection • Rusting or pitting of metal work e.g. D-rings	Mandatory

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R2.3 Demonstrate how to correctly fit a harness.	For example, the need to: • Ensure D-ring is situated halfway between the shoulder blades • Ensure harness is correct ‘tightness’. For example, for leg straps you should be able to fit a flat hand between the strap and the wearer’s leg, but not a fist • Ensure chest straps are adjusted so that the front D ring is at the sternum • Ensure straps are not twisted • Carry out a ‘buddy’ check to ensure harness is correctly fitted and adjusted	Mandatory

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Unit R3 - Using fall arrest lanyards

The aim of this unit is to assess the learner's practical skill in the correct use of fall arrest lanyards

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R3.1 Demonstrate how to correctly attach fall arrest systems to a harness.	• The use of front and rear attachment points • The use of a maillon as a connector, or if a karabiner, why a triple action karabiner is preferable	Mandatory
R3.2 Demonstrate how to correctly apply lanyard hooks.	• The use of the correct method for ensuring that the hook is properly engaged • The application of hooks so as not to incur forces that they are not designed to take such as side loadings • Minimising the angle between lanyards e.g. when both in use, to minimise forces	Mandatory
R3.3 Demonstrate how to park double lanyard hooks so as not to bypass the absorber device.	For example: • Use of sacrificial "parking" loops	Mandatory
R3.4 Demonstrate how to apply hooks at a suitable height to minimise fall factors.	• Hooks should be placed as high as reasonably possible to minimise fall factors • Hooks should be placed on 'horizontal' steelwork where possible to prevent the hook from falling to a lower position • Hooks should never be placed below knee level	Mandatory

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R3.5 Demonstrate how to use fall arrest lanyards appropriately when the steelwork is too large for lanyard hooks.	For example: • Choking back onto lanyard only when tested eyes provided • Use of fixing strops etc around fixed structural anchors • Using retractable lines etc when necessary • Anchor point slings (to EN795) can be used to attach to	Mandatory

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Unit R4 - Selecting appropriate anchor points

The aim of this unit is to assess the learner's knowledge and practical skill in selecting safe anchor points

Knowledge & understanding

- Outcomes R4.1 and R4.2 are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R4.1 Know how to select an anchor point which can support the loads that will be applied to it.	For example: • Fall arrest safety anchor eye bolts • Structural anchors such as large steel beams on site • Formal anchors which are marked with an inspection date • EN795 Class A1: Structural anchorages designed to be secured to vertical, horizontal and inclined surfaces	Mandatory
R4.2 Know the type of anchor points which would be unsafe.	For example: • Antenna mounting bracketry • Grillage platforms • Platform handrails • Feeder or cable brackets • Anti-climb devices	Mandatory

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Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R4.3 Demonstrate how to select an appropriate anchor point which provides an unhindered (as far as possible) path to the ground when conducting a rescue.	Awareness of the following: • The best anchor point will allow a straight drop / route • The possibility of directing the casualty sideways to allow the best vertical route • Possibly needing to go much higher than the casualty for your anchor point to achieve this • The need to avoid edges and protect the casualty from them if sharp	Mandatory
R4.4 Demonstrate how to select an anchor point which provides the rescuer with a safe working position from which to operate the descender (where a remote lower is used).	• Having a clear view of the overall operation • Being able to safely attach whilst maintaining a clear view	Mandatory
R4.5 Demonstrate how to protect lanyards, slings and rescue ropes from sharp edges.	For example: • Ensuring that the rescue rope never goes directly over a sharp edge • The range of protective equipment available such as simple rope covers and edge mats to intricate roller devices • Ensuring that the edge protector does not hinder the rope movement but provides a barrier between the rope and edge • Ensuring that the edge protector is secure at the edge to prevent it slipping away • Monitoring the edge protector as it is a point of potential failure	Mandatory

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Unit R5 - Using fixed fall arrest systems

The aim of this unit is to assess the learner's practical skill in the correct use of fixed fall arrest systems

Practical skills

- This outcome is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R5.1 Demonstrate the safe and correct use of fixed fall systems.	For example: • Systems such as Latchways, Glideloc, Railok and Metreel all work on the same principle of secure attachment to them with smooth movement of the travelling / attachment device whilst attached • Understanding how to attach at a place of safety and be familiar with the operation of the system / traveller • Understanding of attachment and detachment • Awareness of the limitations of devices • Ensuring that the attachment device is secured properly to the fixed system before leaving the place of safety	Mandatory

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Unit R6 - Using work positioning lanyards

The aim of this unit is to assess the learner's practical skill in the correct use of work positioning lanyards.

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R6.1 Demonstrate how to attach a lanyard correctly to the ladder or steelwork system.	• Lanyards are designed to hold the user in restraint, so a fall cannot occur, or to hold the user in a position of work where a fall may occur • Awareness that if a work positioning lanyard is being used the user should be backed up with a fall arrest device • Lanyards should be used in conjunction with a fall arrest harness to provide additional support to the user, allowing them to work more comfortably and safely • A work positioning lanyard has no shock absorbing properties, it is not a fall arrest lanyard and must not be used for this purpose • All pole straps can be adjusted for to pass round the support structure and to accommodate different size users, keeping the person working at height comfortable and safe	Mandatory
R6.2 Demonstrate how a fall arrest system is used in addition to the work positioning lanyard.	• The fall arrest system is the protection device. • The positioning device assists and makes the user comfortable and secure whilst working	Mandatory
R6.3 Demonstrate how to attach a work positioning lanyard correctly to the harness.	• The work positioning lanyard is normally attached to the EN358 D rings on the side waist area with the rope going around the structure and attaching to the other side. • There is an adjusting device to lengthen the rope and karabiners/ snap hook on the end to secure into the harness D ring	Mandatory

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R6.4 Demonstrate how to lean back and trust the work positioning lanyard leaving hands-free.	• Using the lanyard to free up hands for work	Mandatory

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Unit R7 - Using additional fall prevention equipment

The aim of this unit is to provide learners with the knowledge and skills to use the additional PFPE necessary to access some parts of masts and towers.

Knowledge & understanding

- Outcome R7.1 is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge and understanding	Assessment
R7.1 Know when and where additional fall protection equipment will be required for safe working at height.	For example: • Fall protection equipment like retractable lines, drop-lines and slide-chucks may be required when climbing down the face of a large structure (where steelwork is too large to apply a lanyard hook) or where the use of such equipment would minimise the risk from human error as lanyards can be incorrectly applied etc. • On large towers where there are long horizontal beams between legs, a tensioned horizontal line may be required to provide an anchor point when traversing between legs	Mandatory

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Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R7.2 Demonstrate how to safely use a range of equipment.	The user must be fully aware of how to operate equipment and understand the safety features, limitations of the equipment, inspection requirements and training requirements if applicable. For example: • Retractable line systems (angles of operation) • Drop lines • Tensioned horizontal lines	Mandatory
R7.3 Demonstrate how to inspect additional fall protection equipment and identify any safety issues before use.	• The need to refer to user manuals and ensure that individuals involved are suitably aware and trained in how to use the equipment • The importance of checking equipment before and after using it • An understanding of the correct operation of equipment to enable proper inspection. • An understanding of what not do with the device	Mandatory

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Unit R8 - Developing rescue plans

The aim of this unit is to assess the learner's knowledge and understanding of the need for an effective rescue plan and the issues to consider, and their ability to communicate effectively for any work at height on masts and towers.

Knowledge & understanding

- Outcomes R8.3 and R8.5 are mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R8.1 Know the importance of having detailed knowledge of the site where work is taking place.	• Awareness that pre-planning is vital to ensure that a rescue plan can be thought through in terms of the required rescue kit and / or equipment • The precise address reference, which may be remote, should be recorded as this may be vital for the emergency services • Access to the site for emergency vehicles should be recorded and planned for	Optional
R8.2 Know the potential pitfalls associated with reliance on postcodes.	For example: • In rural areas postcodes are vast, plans need to be made as to direct an ambulance or emergency service vehicle. Where possible, a street name should be included	Optional
R8.3 Know the level of competence of others who may need to participate in a rescue.	For example: • At least one competent person is needed to rescue another person • Everyone should be familiar with the on-site rescue kit and acquainted with the emergency arrangements in place • In a two-person team, both should be competent First Aiders • The rescue plan should include if technical expertise is needed to access the site. If so, a minimum of two individuals in the rescue team need to have the specific skills required	Mandatory

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R8.4 Know the types of rescue situations when radio communications may need to be used.	For example: • A radio system may be essential when working on a large structure when wind noise would make it impossible to communicate normally • During a rescue from significant height the drop line may be required to be pulled at a certain angle to assist the rescue with moving the casualty away from part of the structure • Additionally, the rescuer may be stabilising the casualty at height and speaking via radio to other team members on the ground or even a paramedic who may be en-route	Optional
R8.5 Know the importance of having suitably trained First Aiders in attendance when people are working at height.	Awareness that: • The first few minutes can be vital to stabilise an injured person. It can be a matter of life or death • The casualty may not be able to be moved to ground and could be unconscious. The first aider must act quickly to secure the casualty in a position that avoids suspension syncope developing • The site could be remote and the person working alongside the injured party may be the only person immediately able to help	Mandatory
R8.6 Know the reasons why all potential rescuers need to be familiar with the specific rescue equipment provided.	Understanding that: • A rescue needs to be effectively time controlled to reduce the need for the rescuer to need rescuing • Allows the rescuer to focus on the rescue and injured party	Optional
R8.7 Know the importance of having a suitably equipped rescue kit readily available.	Understanding that: • A rescue needs to be effectively time controlled to reduce the casualty from suffering from further issues • The rescue kit should be ready to use as this saves those vital seconds and allows the rescuer to focus on the injured party	Optional

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Practical skills

- This outcome is mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R8.8 Demonstrate the ability to communicate appropriately in rescue situations.	Climbers must maintain visual contact with each other. If in a two-person team and one person is at ground level, that person must retain visual contact e.g. must not leave site or work within a building with no visibility of person on structure. A range of communication methods may be used, for example: • Mobile phones • 2-way radios • Loud speakers • Hand signals It is essential that climbers can communicate with and are always visible to each other.	Mandatory

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Unit R9 - Managing suspension syncope

The aim of this unit is to assess the learner's knowledge of suspension syncope and the importance of responding quickly when somebody is suspended in a harness.

Knowledge & understanding

- Outcomes R9.2, R9.3, R9.5 and R9.7 are mandatory and must be assessed for this unit.
- Please select 2 optional outcomes to assess for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R9.1 Know the causes of suspension syncope.	An understanding that: • "Suspension syncope" is used to describe the situation of a person falling into suspension in a harness and then becoming unconscious • Loss of consciousness is not due to any physical injury, but motionless vertical suspension • "Syncope" is the sudden transient loss of consciousness with spontaneous recovery, as may occur with a simple faint." - HSE 2008 • If an injured party is unable to use or move his or her legs, they will eventually faint as blood collects in the legs and is not returned to the rest of the body especially the brain • Normally when someone faints they will fall over, and blood will rush back to the brain If a person is prevented from falling blood does not return to the brain	Optional
R9.2 Know the symptoms of suspension syncope.	An understanding that: • Typical symptoms include pallor, sweating, shortness of breath, blurred vision, dizziness, nausea, hypotension and numbness of the legs. • Suspension syncope eventually leads to fainting, which may result in death due to oxygen deprivation of the brain.	Mandatory

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R9.3 Know how to minimise fall factors.	• Lanyard attachment to be correctly positioned above the person whenever possible • Use of the shortest length lanyard possible that allows the job to be performed	Mandatory
R9.4 Know the factors which ensure a good fitting climbing harness.	For example: • Correct training in putting it on • An adjustable harness • Flexible fabrics • The harness should be the correct size for the individual	Optional
R9.5 Know the techniques that can be used to alleviate the onset of suspension syncope.	For example • If someone is stranded in a harness, but is not unconscious or injured, and has something to kick against or stand on (such as a ledge or leg-loops) it is helpful for them to use their leg muscles by pushing against it every so often, to keep the blood pumping back to the torso • If the person is stranded in mid-air or is exhausted, then keeping the legs moving can be both beneficial and rather dangerous. On the one hand, exercising the leg muscles will keep the blood returning to the torso, but on the other hand, as the movements become weaker the leg muscles will continue to demand blood, yet they will become much less effective at returning it to the body, and the moment the victim ceases moving their legs, the blood will immediately start to pool • If it is impossible to rescue someone immediately, then it is necessary to raise their legs to a sitting position, which can be done with a loop of rigging tape behind the knees or specialized equipment from a rescue kit	Mandatory
R9.6 Know the temporary aids which can be used to alleviate the onset of suspension syncope.	• Leg straps can be used to allow the legs to be raised and/or supported • Many other simple leg raise devices exist	Optional

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R9.7 Know how to position a casualty correctly when they are evacuated to ground level.	An understanding of the following: • Once a casualty is back on the ground after a fall has been arrested on a fall protection system, the casualty should be placed in the recovery position	Mandatory
R9.8 Know how to care for a casualty after rescue.	After a casualty has been rescued, there are very specific post-rescue care instructions that need to be followed. For example: • Once blood can flow freely throughout the casualty's body again, the casualty is at risk of suffering from Reflow Syndrome. Reflow Syndrome is, "the return of pooled, hypoxic blood with metabolic by-products from the extremities to the heart." • If blood cannot circulate throughout the body, it begins to accumulate carbon dioxide and other bodily waste products that can be dangerous for the human body to process in large amounts. When blood is full of carbon dioxide and other metabolic waste, the heart and other organs are at risk of failure • In this situation a KED board can still be used if there are any potential spinal injuries and a casualty needs stabilization before transport	Optional
R9.9 Know how to handover a casualty to a first aider or emergency services.	For example: • It is important to inform the First Aider or emergency services that the person may have suffered from suspension syncope • Inform them on any known medical issues • Inform them if the injured person lost consciousness and estimate how long they were in this state • Inform them how long the casualty may have been hanging • Provide the casualty's personal details	Optional

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R9.10 Know the risk factors for potential venous pooling.	For example: • Fainting or collapsing • Heart failure in extreme cases	Optional
R9.11 Know how to prevent venous pooling.	• Leg raising where possible • Pumping legs against a fixed surface or pushing against a loop of webbing or rope	Optional

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Unit R10 - Selecting rescue techniques

The aim of this unit is to assess the learner's understanding of the importance of personal safety when carrying out a rescue, and to assess their knowledge of the appropriate rescue technique in accordance with a hierarchy.

Knowledge & understanding

- Outcome R10.2 is mandatory and must be assessed for this unit.
- Please select 1 optional outcome to assess for this unit.

Learning outcomes	Knowledge & Understanding	Assessment
R10.1 Know how to minimise risks to personal safety in a rescue situation.	For example: • Apply good practice • Do not repeat the original error • Involve extra people if possible	Optional
R10.2 Know the general rescue hierarchy.	For example, as described in Section 5 GN008: • Self-rescue • Stretcher rescue • Remote rescue/assisted lower • 'Snatch' rescue	Mandatory
R10.3 Know the circumstances in which a casualty may be self-rescued with the possible assistance of a rescuer.	For example: • The person is conscious • The person can be easily lowered • The person can still be attached to move to a safe place	Optional

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R10.4 Know when the remote lowering of a casualty by a rescuer may be appropriate.	For example: • When it is a straight drop or easy drop • The correct rescue device is available	Optional
R10.5 Know when a “snatch” or “pick off” rescue of a casualty may be appropriate.	For example: • When the casualty needs assistance to manoeuvre past obstacles and other climbers are not available to assist in a remote lower • Where the rescuer needs to abseil down to a position to attach the casualty • Where descent device has adequate capacity	Optional
R10.6 Know the role of the emergency services in relation to industrial rescue.	• The primary role of a fire and rescue authority in an emergency is to extinguish any fire and rescue. anyone trapped by fire, wreckage or debris • They will prevent further escalation of an incident by controlling or extinguishing fires, rescuing people, and undertaking other protective measures • They will work with organisations to plan but this is region dependant	Optional

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Unit R11 - Using “off-weighting” techniques

The aim of this unit is to assess the learner’s understanding of the use of appropriate off-weighting techniques and the risk associated with the use of knives in rescue scenarios.

Knowledge & understanding

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge & understanding	Assessment
R11.1 Know the reasons for using mechanical aids when transferring a suspended casualty.	For example: • Speeds up the process • Prevents manual handling injuries • Provides mechanical advantage • Minimises personal error and cutting of the ‘wrong’ rope • Reducing any further shock loading to a structural anchor that may have been compromised by the fall	Mandatory
R11.2 Know the risks associated with using knives or other cutting implements in a rescue situation.	An awareness that a rescue situation is stressful, and mistakes can easily be made, for example: • Knives can cut the wrong rope etc • Sudden loading of personal fall protection equipment and the rope can lead to damage and further injury	Mandatory

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Unit R12 - Demonstrating climbing techniques

The aim of this unit is to assess the learner's skills in safe climbing and descent techniques.

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R12.1 Demonstrate a fluid climbing technique on the ladder.	For example: • Maintaining permanent attachment, to the rungs and not the styles • Lanyard hooks placed at sufficient height and previous one is replaced before it is situated below a climber's waist • Minimising fatigue by taking frequent rests	Mandatory
R12.2 Demonstrate how to safely **ascend** away from the ladder whilst maintaining permanent attachment.	For example: • Using retractable lines or drop lines appropriately • Using lanyards appropriately	Mandatory
R12.3 Demonstrate how to safely **descend** away from the ladder whilst maintaining permanent attachment.	For example: • Using retractable lines or drop lines appropriately • Using lanyards appropriately	Mandatory

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Unit R13 - Carrying out a rescue

The aim of this unit is to assess the learner's ability to carry out a rescue.

Practical skills

- All outcomes are mandatory and must be assessed for this unit.

Learning outcomes	Knowledge, understanding and skills	Assessment
R13.1 Demonstrate self-rescue	For example: • Configure the descent device for abseil • Add additional friction to rope if required to ensure controlled descent • Operate descent device in a controlled manner to ensure steady descent • Use legs to avoid obstructions (do not use hands unless stationary and device locked off) • 'Lock' device when stationary to avoid uncontrolled descent	Mandatory
R13.2 Demonstrate how to remotely lower a casualty.	For example: • When it is a straight drop or easy drop • The correct decent or rescue device is available and used	Mandatory
R13.3 Demonstrate a "snatch" or "pick off" rescue of a casualty.	For example: • Knowledge of descent device, capacity and harness capacity etc • It may be a last resort • The casualty is unconscious • Immediate first aid is required	Mandatory

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R13.4 Demonstrate using an off-weighting device to remove the casualty from the fall arrest device.	An understanding of the range of mechanical aids, for example: • The “Petzl cracker” system	Mandatory
R13.5 Demonstrate using a tensioned pilot wire for bringing the casualty out and away from the structure.	• Where structure is congested there may be a need to bring casualty out and down a pilot • Pilot can be made up by terminating a rescue rope to the structure and tensioning it with the assistance of an ascender or other cammed device e.g. Petzl ID • Deviation of the casualty can be made by putting a pulley on the pilot rope and attaching this through karabiner to the casualty	Mandatory
R13.6 Demonstrate how to tie a range of common knots used in work at height procedures.	A minimum of: • Figure of eight • Clove hitch • Stopper • Bowline	Mandatory

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