

SHE008 Issue 3.0

Climbing & Working at Height on Masts & Towers

Introduction

This document details the mandatory requirements that Arqiva contractors, site sharers and tenants must follow when climbing and working at height on Arqiva masts and towers.

Risk Assessment

Companies planning works on masts and towers, must undertake a risk assessment to determine the most appropriate means for access and working at height, whilst taking account of the 'work at height hierarchy' as per Regulation 6 & 7 of the Work at Height Regulations. Contractors must record this risk assessment to assist in articulating and justifying the use of climbing techniques over the selection of other work at height equipment. A further general risk assessment will be required on the work at height activity itself once the most appropriate methodology has been determined.

Training & Competency

The minimum training requirements for accessing Arqiva masts and towers is climbing, mast rescue, RF awareness and first aid. With the exception of the first aid course, only courses reviewed and accepted by Arqiva (and listed on the [accepted training provider list](#) on arqiva.com) are acceptable. Arqiva has standard expectations around the content that should be covered. The minimum durations of courses to ensure adequate coverage are set out below:

Course/Modules	Course Duration	Certificate Validity (Months)
Climbing*	3 day (initial course)	12
Rescue from height	1 day	12
Radio-Frequency Awareness	½ day	36
Rooftop Safety	1 day	36

*the necessary refresher climbing module content is revalidated as part of the 12 monthly rescue training

Arqiva recognises that formal training is only a part of ensuring competency and therefore contractors must have a suitable competency plan in place that incorporates:

- Supervision requirements for climbing trainees
- Specific work at height/lifting operations training in accordance with job role
- Ongoing development of climbers to gain practical job skills not otherwise covered in formal training courses
- 'Grading' or assessment processes for progression within a climbing team (to include a minimum period of time on the job before progression)

Minimum Age

The minimum age for climbing Arqiva masts and towers is 18. Between the ages of 18-21 Arqiva will require further evidence of competency.

Medical Assessment

All climbers must be subject to a regular medical assessment. The Mast and Tower Safety Group document 'Medical Requirements for Climbing Masts and Towers- GN005' details what should be covered in a medical.

Permanent Attachment

Climbers must be attached at all times- Mast and tower climbers shall be attached to a purpose installed or robust structural anchor point at all times by means of a fall arrest device. Attachment shall not be required when working

on fully protected platforms (when trapdoor down) or when fall distance <3metres and no fixed fall arrest system is attached.

Lanyards must contain an energy absorbing system which minimises likely forces on the body to <6kN.

Climbers must ensure that lanyard hooks are only attached to undeniably robust anchor points and not- (including but not limited to) open-grid flooring, studs, feeder clamps, some handrails etc which may fail in the event of a significant applied force. Lanyards must not be 'choked' or attached to vertical anchor points e.g. ladder stiles, due to the lateral forces imposed on the lanyard hook gate. Lanyards must be attached at a point as high as possible on the structure in relation to the climber to limit the potential fall distance. As a rule, lanyards hooks should never be below the climber's knee level.

Use of the twin-lanyard technique over significant heights is fatiguing and may increase the likelihood of a fall so adequate rest should be regularly taken during the climb, either at purpose-made rest platforms or through attachment of the work positioning device. A specific risk assessment should be undertaken on any climb in excess of 45m where twin-lanyard technique will be used.

Fixed Fall Arrest Systems

Where a fixed fall arrest system is installed i.e. latchway (hooped ladders are not fixed fall arrest systems) it must be used if in a serviceable condition. Users must check the latchway system pre-tension before use- at the correct cable pre-tension, the unit's indicator disc at the bottom anchor will spin freely. If the fluorescent red shaft is observed to extend from the energy absorber at the top bracket, the system must not be used as this indicates that it may have arrested a fall.

Where a fixed fall arrest system is not installed or the climber does not have the appropriate fall arrest trolley, the height of the climb must be restricted to 45m. Above this height a method statement and risk assessment must be issued to SHE for approval which details the rest breaks to be taken to avoid fatigue. Remove?

Climbing Equipment

As a minimum, climbers must have a helmet with chinstrap, full body harness, fall-arrest twin-lanyard and work positioning pole belt for climbing as well as access to a suitable rescue kit. Those responsible for planning work at height must ensure that additional equipment is available for climbers so that alternative techniques to the use of twin-lanyards can be employed where necessary. Drop-lines with slide attachments, abseil equipment or retractable lines should be considered as an alternative to lanyards when ascending/descending the faces of large structures; such techniques are less fatiguing on the user and less prone to human-error (through misplacing of lanyard).

Where the faces of large open structures need to be traversed, it is not acceptable for the climber to 'attach' by lanyard to the structural member at their feet (which they then traverse along on foot or by shuffling along on bottom). Ropes should be dropped from above or a horizontal safety line should be set up to attach to.

'Safe to Climb' Certificates

The term 'Safe to Climb' certificates covers the means by which some companies who own broadcasting and communications structures inform the 'user' that it has been inspected and deemed "Safe to Climb'. The term covers actual documents or certificates that can be provided to the user or inclusion of the necessary details on a 'scafftag' type system that is left at the base of the structure.

Arqiva does not issue a safe to climb in either of the aforementioned formats as it deems such certificates to be only accurate at the time of inspection. They cannot cover unforeseen structural damage, which may occur between inspections due to wind, lightning, ice impact or vandal attacks, and they take no account of possible RF radiation hazards. Arqiva considers safe to climb certificates to be misleading, and potentially dangerous.

Arqiva implement a robust inspection and maintenance programme that ensures all structures, access and fall arrest systems are inspected on a minimum frequency of 2 years and maintained in a satisfactory condition. Whilst 'Safe to Climb' certificates are not issued, the Gateway access permit provides confirmation of when the structure was last inspected. Temporary Access Restrictions (TAR's) are placed on Gateway when significant hazards are identified during the inspection (or subsequently via a post work report) and these TAR's prevent permits from being issued. Faults or hazards that can be managed safely on site are brought to the attention of climbers on the Risk Register section of the Gateway permit. The Gateway permit system therefore ensures that any accredited climber is informed of all known limitations or restrictions in place at the time of climbing a specific structure.

Notwithstanding this, prior to any climbing activities the Climbing Team Leader and the Arqiva Site Attendee (if present), should undertake a pre-climb risk assessment/survey. This should consider the location for the activity, the method/nature of the work and the expected duration, to check for likely hazards and restrictions, including those associated with access and protection from falls. Should a hazard be identified that has not been highlighted by Arqiva, this must be reported. Significant SHE hazards are to be reported via the Arqiva Accident, Incident and Near

Miss Report Line and more general issues should be reported back to Arqiva via the Post Work Report facility in Gateway.

Accompaniment

Contractors must not allow climbers to ascend any structure unless a second person, competent and equipped to climb either accompanies that person or remains in contact at the base of the structure. A climber must not climb above 75m alone.

For climbing activities above 120m (including where access to the height is achieved by lift or man-riding basket), there must be a minimum of three competent and equipped climbers on site (all three persons remaining in contact with one another through radio etc). One of these climbers may remain at ground level but there must be a minimum of two climbers on the structure at all times. Arqiva contractors and third party site sharer contractors must provide a minimum of three climbers and must not rely on the Arqiva supervising rigger (site attendee) to supplement their numbers for accompaniment purposes. There should never be more than 75m distance between climbers on the structure at any time (in order that any problems can be identified and a response initiated quickly).

Man-Riding Systems

Where work at height is above 120m and lasts for 3 or more days, man-riding baskets should be set up and used rather than climbing as a means of access/egress to tall structures. When travelling in the man-riding basket, climbers must be attached at all times by means of their fall-arrest lanyard to a suitable anchor point. When the 'landing' point is reached the basket must be tied in to the structure. Climbers transferring from the basket to the structure must not detach themselves from the basket until they are securely attached to the structure, by means of their fall arrest lanyard. A 'Mussons' fall-arrest system must be used on man-riding systems with the exception of those used for stay-greasing activities. When an 'out to out' rig is used (where the lifting bond travels up the outside of the structure and goes through an external pulley) a secondary pulley or passive sling must be used to protect against primary pulley, sling or shackle failure.

Access to Antenna Spines

The specific hazard associated with antenna spine access is restricted space which requires special consideration around climber physical characteristics, fitness and rescue procedures.

Contractors must provide evidence to Arqiva that those individuals accessing antenna spines have been subject to additional medical assessment that covers the specific risks associated with working in a restricted spine.

Specific risk assessments and method statements must be in place which include an effective procedure for rescue.

The following S1 antenna spines are particularly restrictive in space:-

- Emley Moor
- Stockland Hill
- Sutton Coldfield

Only climbers with a maximum circumference <120cm should attempt access. Specific information relating to required access and rescue procedures are available from Arqiva SHE on request. Arqiva SHE must review RAMS before any works proceed.

Climbing with Employees from Other Companies

All climbers in a climbing team must be part of the same company. The only exception to this is when a specialist company is required to undertake a survey or an Arqiva climbing team is undertaking a survey/snagging visit or quality inspection in conjunction with another organisation. In these instances the following rules will apply:

Two climbers - Both from different companies

- there is a height restriction of 60m (standard rescue kit rope length)
- only to be undertaken when completing a survey or quality inspection, no work is permitted
- both climbers are in possession of a rescue kit which is located at the base of the structure
- The documented toolbox talk should include the specifics as to what to do in the event of an accident e.g. call ambulance, undertake a rescue or not, call respective companies post incident, level of climber, when was the climber last trained in rescue etc
- documented agreement as to what part of the structure will be accessed and who will be the lead climber
- the lead company should book the Gateway permit and select another person who is not climbing from the same company. They should state in the scope of works who the additional climber is. This climber must be an approved Gateway climber.

Three climbers - 2 climbers from Company A and 1 climber from Company B

- there is a height restriction of 120m (standard rescue kit x 2)
- there is a minimum of 2 rescue kits on site which is located at the base of the structure
- 3rd climber is to be undertaking a survey or quality inspection only
- The documented toolbox talk should include the specifics as to what to do in the event of an accident e.g. call ambulance, undertake a rescue or not, call respective companies post incident, level of climber, when was the climber last trained in rescue etc
- the climbers from Company A act as the lead climbers and are assigned responsibility for rescue in the event of a single person fall
- company A should book the Gateway permit and select another approved climber from that company that will be present. They should state in the scope of works who the additional climber is. This climber must be an approved Gateway climber.

Dropped Object Protection

When work at height is taking place on masts and towers there is a risk that objects may be dropped and that persons at ground level could be struck. Contractors, site sharers and tenants must take a two-pronged approach to mitigating this risk when working at height on Arqiva sites:-

- Prevent objects from falling
- Control access into areas where objects could fall

An ‘Authorising Person’ must be established before work at height commences and this person will be responsible for ensuring that the necessary control measures are implemented. Unless otherwise agreed and documented, the authorising person will be the person that holds the most senior role within the climbing party.

Further information on dropped object control measures can be found in Appendix A. If these control measures cannot be implemented, the authorising person must carry out and record a risk assessment which demonstrates that the risk from dropped objects is minimised through other measures.

Capstan Winches

Capstans are generally marked with a working load limit (commonly 450kg) representing the maximum load the winch is capable of lifting under test conditions. Due to the height of Arqiva structures and the conditions in which they are operated, a 2:1 factor of safety must be applied to capstan winches, reducing their WLL down to 225kg. Using this figure, typical weights of dishes and likely wind loadings, Arqiva provides the following guidance regarding what dishes can be lifted and to what heights (this information can be extrapolated for determining whether other loads can be lifted):

Dish Size (Diameter)	Height of Lift				
	10m	30m	45m	100m	200m
0.6m	✓	✓	✓	✓	✓
1.2m	✓	✓	✓	✓	✓
1.8m	✓	✓	✓*	X	X
2.4m	X	X	X	X	X
3.0m	X	X	X	X	X

*The procedure does not apply to the 1350kg WLL capstan winch. If this type of winch is proposed to be used it must be supported by structural calculations to ensure the weight of the winch and load to be lifted or lowered does not have a detrimental impact on the structure.

Other factors that must be considered when using capstan winches are:

Fibre Ropes- It is important that the correct type of rope is selected which is low stretch and has good gripping properties. The rope lock device, which is mandatory for lifting/lowering operations, accepts rope sizes from $\frac{1}{2}$ " – $\frac{3}{4}$ " diameter only, so rope sizes must be within this range. A composite fibre braided rope, such as a 16mm Marlow with 6650kg MBL, is recommended by the supplier. Selection of the incorrect rope could lead to excessive heat build-up and failure due to the rope slipping round the drum.

Pilot lines- At heights about 45m the lifting operation must include the use of a fixed pilot line, holding out lines and haul lines should not be used above this height to keep the load away from the structure.

Anchor Points- To use a capstan winch you require an anchor point. If you are working on a tower this can generally be one of the tower legs. If you are working on a mast there will be no suitable anchor point that you can use on the structure. Series 90 capstan winches can be anchored to vehicles but only when used in conjunction with a purpose made bracket supplied by the winch supplier or manufactured by a competent engineer (and supported by design calculations). In addition, the users must satisfy themselves that the vehicle and tow bar are capable of taking the loads imposed. When a bracket and tow bar are to be used as an anchor point the user must ensure the rope is in line with the tow bar and not at an angle, the weight of the load being lifted/lowered is not too great for the vehicle etc. Gates and fence posts must not be used as anchor points.

Time Allocated for the Job- There are limitations on the speed that the fibre rope can travel around the capstan winch drum. If the job involves a number of lifts / lowers a rough calculation should be undertaken based on the height of the lift / lower point and an average travel speed of the rope. This should enable the team to ensure there is sufficient time allocated for the job to be completed.

Position of the Operator- The operator is not permitted to stand underneath the suspended load and must be able to view the landing point of the load.

Weather Conditions and Wind Speed- Regardless of all prior planning if weather conditions on the day of the job are inclement e.g. wind, rain and fog reducing visibility then work should not go ahead. Capstans should only be used where average wind speeds at 10m (in open terrain) are no greater than 15mph with maximum gust speeds at the same level not exceeding 30mph.

Lowering- Lowering using a capstan is more likely to cause rope damage due to it being 'slipped' around the drum and generating heat. If multiple lowering operations are planned then the method statement for the task must include checking the rope between each operation.

Ground Anchors

Many of the Arqiva tall mast sites have permanent dedicated lifting blocks or lifting saddles on stay anchor blocks that can be used for lifting activities.

Lifting saddles and anchor blocks may only be used after contractors have carried out pre-use inspection and test, to confirm that they are suitable to take the loads (imposed during the proposed work). This may constitute a pull-test using an item of plant i.e. telehandler and suitable load-cell i.e. piab. Lifting saddles that are found to be damaged must not be used and must be reported to Arqiva. Damaged saddles must not be re-bent into shape as this weakens the steel and may result in failure.

Aluminium Blocks

Aluminium blocks with SWL/WLL marked by the manufacturer in kg or tonnes, are acceptable for use however many lightweight aluminium pulley blocks are stamped with a minimum breaking load (MBL) in kN which presents two issues:

- A MBL is not derived after applying a suitable factor of safety; attempts to lift items of an equivalent weight to the marked MBL is highly likely to result in failure of the pulley block
- Whilst LOLER does not specify a unit of measurement for markings on lifting accessories, kN is a unit of force and therefore users of equipment with it marked need to ensure that they understand the calculation they need to do to convert force into load. As a rough guide, $\text{kN}/10 = \text{tonne}$ (e.g. $10\text{kN} = 1\text{t}$).

In order to use pulley blocks with MBL or kN marked, users should be able to demonstrate understanding of the rated capacity of the equipment, and be able to apply that to the load that they are lifting. This can be demonstrated in one of the following ways:

- The pulley blocks are permanently etched or marked with a SWL/WLL (after application of a suitable factor of safety). This marking should be undertaken, in a way that does not affect the equipment's integrity, by a competent person.
- The derivation of a suitable SWL/WLL for the equipment is recorded on a Declaration of Conformity or within the working party's risk assessment and method statement. The users of the equipment should be able to demonstrate cognisance and understanding of the SWL/WLL calculation where it is not marked on the equipment.

The terms SWL and WLL do describe different things, however as both are derived after dividing the Minimum Breaking Load (MBL) by an appropriate factor of safety, loads up to the SWL/WLL can be lifted with a degree of confidence (further de-rating of the equipment may be required depending on configuration, conditions etc).

Appendix A Dropped Object Protection

1. Preventing Objects from Falling

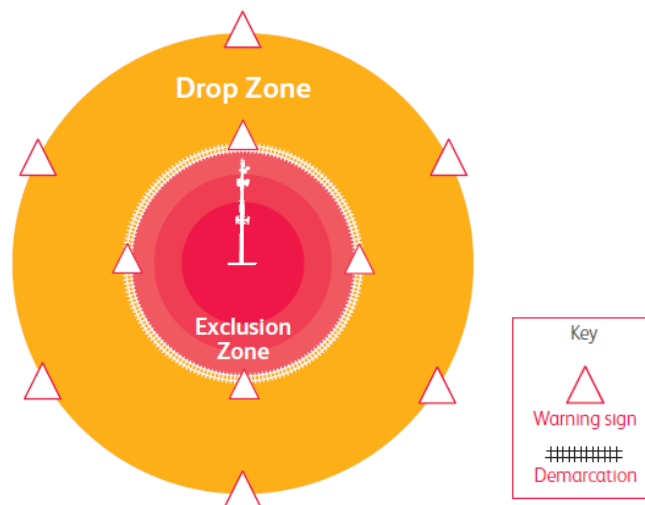
The following precautions must be taken to prevent objects falling from height:

- Remove tools and equipment that are not required to complete the task from bolt bags or harnesses
- Ensure that bolt bags, tool frogs etc are in a good condition and have 'closures' to prevent objects from falling
- Ensure that dedicated tool tethering equipment is available before climbing and that all objects to be carried aloft (apart from nuts, bolts and washers) can be tethered
- Tether hand-tools and other objects that will be handled aloft (e.g. radios) at all times.
- Report any equipment at height that is loose or is deteriorating to the extent that it could become unsecured from the structure to the Arqiva structural engineering team
- Remove any loose detritus from the structure that could become a dropped object risk. Examples of such items are loose objects on work platforms, pieces of wood (used for holding off bonds) etc. Report as a near miss where found
- Only using lifting equipment that is rated for the load to be lifted and has been subject to thorough examination within the last 6 months
- Know the weight of any object to be lifted to ensure lifting equipment working load limits will not be exceeded
- Ensure that risk assessments and method statement include clear and concise communications plans so that lifting operations are carried out safely and works at height can be ceased if there is a breach of the drop zone or exclusion zone
- When lifting, avoid inadvertent contact with any existing equipment on the structure
- Use a 'back-up' or 'safety-sling' where lifting accessories supporting the load could be compromised

2. Controlling Access

Whilst the above measures will reduce the likelihood of falling objects, they are still a possibility. Therefore, access to areas around the base of the structure must be strictly controlled. For works on masts and towers, the authorising person is responsible for ensuring that a risk assessment is in place which specifically covers the establishment of an exclusion zone and drop zone. Guidance on what controls are required is detailed in 2.1-2.4 below. Where these controls cannot reasonably be implemented, it is the responsibility of the Authorising Person to determine what is appropriate and to record the rationale and chosen controls within their risk assessment before commencing work.

The drawing below shows an example of how drop zones and exclusion zones may be established.



2.1. Exclusion Zones




The exclusion zone is the area closest to the structure where most dropped objects will land. The following controls must be adhered to:

Zone	Controls
Exclusion Zone	<ul style="list-style-type: none"> The zone must be physically protected by fencing or pedestrian/crowd control barriers. Cones or spikes with red and white warning tape are acceptable only where the authorising person has designated a 'grounds-person' to remain at ground level at all times, patrol the exclusion zone and prevent unauthorised access. The zone must be defined by signage similar to that shown below (do not use Arqiva logo) prohibiting unauthorised access into the area. A sign must be prominently displayed every 90° around the perimeter of the zone and must contain the name and contact details of the authorising person. <div data-bbox="491 645 938 990" style="text-align: center;"> </div> <ul style="list-style-type: none"> Site offices, welfare cabins, stores, vehicle-parking areas etc, must be situated outside the zone. When work at height is taking place, access must be restricted to those personnel who are actively involved with the work at height activities i.e. the rigging team. Work by the rigging team within the zone must be minimised as far as possible by situating winches and build areas outside of the zone. Work in cabins or areas within buildings that extend into the zone must be prevented unless it can be demonstrated that the roof fabric is substantial enough to withstand the impact of possible dropped objects. Where lifting activities (either materials or man-riding) take place, a lifting lane exclusion zone, commensurate with the height of the structure (e.g. 20m either side of the pilot line for lifts on a 335m mast) must be defined and persons excluded from accessing it. Hardhats must be worn at all times.

2.2. Drop Zones

The drop zone is an area outside the exclusion zone where dropped objects could foreseeably land under certain conditions. The following controls apply:

Zone	Controls
Drop Zone	<ul style="list-style-type: none"> The authorising person must ensure that all persons on site that could enter the zone receive an induction which includes the rules detailed in this appendix. Where the drop zone is not within a locked Arqiva fenced compound and members of the public could foreseeably gain access, the authorising person must install fencing or pedestrian/crowd control barriers, or designate a 'grounds-person' to remain at ground level at all times to patrol the drop zone and prevent access. The drop zone must be defined by signs which include either of the triangular 'hazard' signs below warning of the overhead danger as well as the blue 'mandatory' sign below designating the drop-zone a hard-hat area. The signs must be prominently displayed around the perimeter of the drop-zone such that the detail is visible when the drop zone is approached from any direction.

	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Danger of falling objects</p> </div> <div style="text-align: center;">  <p>Warning Men working overhead</p> </div> <div style="text-align: center;">  <p>Hard hat area</p> </div> </div> <ul style="list-style-type: none"> Members of the public must not be permitted to enter the zone (where farmers etc have rights over adjoining land, arrangements must be made to co-ordinate work and avoid conflict) Where there are roads and footpaths within the zone, the appropriate authority must be contacted in order to obtain closures or diversions. Where this is not possible, other controls must be implemented e.g. <ul style="list-style-type: none"> - Netting the structure - Placing additional ground sentries to warn public of risks and to stop work at height where necessary - Carrying out lifting etc on the opposite side of the structure to the road or footpath Hardhats must be worn at all times
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2.3. Size of Drop Zones and Exclusion Zones

Drop zones and exclusion zones must be sized in accordance with the table below unless a robust site specific risk assessment has been carried out by the authorising person which demonstrates that the risks can be adequately controlled with smaller zones e.g. where work is taking place only at lower levels of the structure. Zones must be extended if risk assessment deems it necessary.

Type of Structure	Size of Structure	Size of Exclusion Zone	Size of Drop Zone
Stayed Mast	40m – 335m	20m radius from centre of structure	50m radius from centre of structure
Self-supporting Tower	40m – 200m	Area within plan of tower plus 10m from each face	Area within plan of tower plus 20m from each face
Emley Moor (working externally)	330m	Area within plan of tower plus 20m from face	Area within plan of tower plus 50m from face
Any structure type	20m - >40m	10m radius from centre of structure	20m radius from centre of structure
Any structure type	0m - >20m	5m radius from centre of structure	10m radius from centre of structure

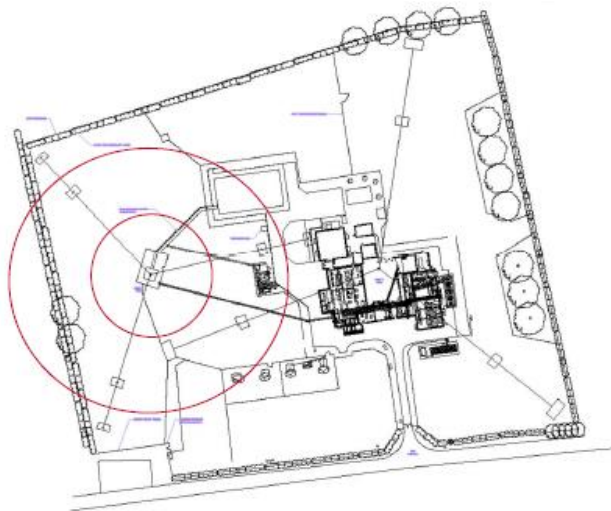
2.4. Further Drop Zone and Exclusion Zone Information

Natural barriers such as well-established hedgerows which are the requisite distance from the structure may be an acceptable form of barrier instead of installing pedestrian barriers/fences etc.

In addition to signage displayed around drop zone and exclusion zone perimeters, the appropriate signage must be displayed:

- At any gate or entrance that leads into the respective zone.
- On the inside of all doors that are used to exit buildings that are located within the respective zone.
- Where any public footpath/access track intersects the perimeter of the respective zone.

For significant, planned works- marked up drawings (example below) must be included within method statements in order that the working party can properly define the zones and communicate (through induction) the required control measures to all workers, visitors and third parties that attend site.



3. Personal Protective Equipment- Hard Hats

Hard hats offer limited protection against dropped objects but it is imperative that they conform to the correct standards and that they are kept in a serviceable condition.

On Arqiva sites, hard hats to EN397 (Industrial Safety Helmets) are the minimum standard for persons who only work at ground level. Hard hats to the more onerous standard of EN14052 (High Performance Industrial Safety Helmets) can also be used. Hardhats to EN12492 (Mountaineering and Climbing PPE) must only be used by climbers who can use whilst working at height and whilst at ground level if not undertaking electrical work or work with molten materials.