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Site Setup and Demining Worksite Safety

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1. Introduction

The nature of the ground will determine the layout of any work site, however a consistent arrangement with correct marking will increase the safety of those involved in the mine clearance operation. The standardisation of all clearance marking systems is paramount.

2. Scope

This standard specifies the minimum requirements for site setup, preparation and worksite safety.

3. Minefield Clearance Site Organisation

The following features are essential requirements for all mine/ERW clearance sites

4. Control of Entry to Demining Worksites

Demining often proves to be an attractive event for the local population, especially children. Procedures shall be developed for controlling the entry of unauthorised persons in to the area. This may include the following.

5. Control Point

Control Point is a command post from which a commander may control the operation. The control point may also be used as administration and briefing area where visitors arrive. Ideally, it should be on level, well-drained land, have vehicle access and preferably some natural shade. It shall not be closer than 100 metres from the mine/ERW worksite.

6. Access lanes

All access lanes to the worksite shall be clearly marked as clear of hazards. They should not be less than two metres wide.

7. Vehicle Parking Areas

This shall be close to the Control Point and large enough to accommodate the mine/UXO clearance organisation's vehicles and any visitor's vehicles. It shall be situated a minimum of one hundred metres from the mined area. The distance can be reduced provided that protective barrier exists between the parking area and the minefield. All vehicles should be positioned in the park so they do not have to manoeuvre to depart in the event of an emergency. Separate areas may also be required for the unloading/ loading of machines.

8. Control Areas

Effective control of the worksite will be achieved by establishing and clearly marking a number of areas for safety and administration that may include the following:

8.1 Stores and Equipment Area

This is an area where all equipment can be securely stored while the team is at work and shall be part of the Control Point. It should include a metal-free area, to be selected adjacent to the stores and equipment area, for checking metal detectors.

8.2 Medical Area

Medical Area is a static medical point, always within the control point. The medical area shall be occupied at all times during mine/ERW clearance operations by a qualified medic. The

medic shall ensure that the area is properly equipped at all times. The area should be flat, dry, and shaded. The area may be combined with the control point or stores area but should be easily accessible from the minefield and clearly marked.

8.3 Helicopter Landing Site (HLS)

In the event that helicopter evacuation is an available option a HLS shall be established prior to demining operations commencing on site:

a) The HLS should be located within five minutes vehicle travel time from the worksite and is not to be within 100m of any area containing mines.

b) The dimensions of the HLS are not to be less than 20m x 20m, with an optimal size of 50m x 30m. Ground slope is not to exceed 6 degrees (1 in 9.5). Areas of very dusty ground should be avoided. The HLS shall be marked with an easily visible marker, in the shape of an 'H', of a minimum size of 2m x 5m, firmly secured to the ground.

The directions of aircraft approach and departure to and from the landing site should be free from trees and other vertical obstructions to an angle of 30 degrees (1 in 1.75) from horizontal, determined from the edge of the HLS. The HLS should be clear of all vegetation to 0.1m above ground level and all boulders and other loose debris should be removed

Demining organisations establishing a HLS should contact the organisation providing the air casualty evacuation service to confirm that the HLS established is suitable for helicopter evacuation. The demining organisation shall also to provide the AMAC and the casualty evacuation organisation with details of the worksite number, HLS Latitude and Longitude coordinates and a brief description of the HLS and marking being used. The HLS is not to be used as a car park or administration area

8.4 Explosives Area

The explosives shall be stored in a secure and marked explosives storage area a minimum of fifty metres away from all other control areas. The explosive area should be sited between the non-operational area (control point/stores area etc.) and the minefield for security. Explosives and accessories shall be kept separated in an area that is dry and protected from rain and sun. If located in the same area then explosives and accessories shall be separated by a sandbagged wall.

8.5 Rest Areas

Rest areas should be established and clearly marked for use by deminers during their breaks from clearance work. These areas shall be established a minimum of twenty-five metres from the mine/ERW area, depending upon the types of mines/ERW being cleared. Sufficient space should be allowed for resting, preparation of equipment, and painting of minefield marking material. If possible the area should be dry and shaded.

8.6 Demolition Area

Demolition area is the location cleared for the disposal, by explosive demolition, of mines and ERW.

8.7 Sentry Points

If, during operations, control of the danger area cannot be maintained by the use of markings, signs, physical barriers or observation, then sentries shall be used. The sentry points shall be positioned to cover all possible approaches to stop people entering into the danger area or to warn the supervisor if people attempt to approach. Sentry points shall be outside the danger area or under suitable cover. If sentry points are inside the danger area and under cover then

that position shall have good visibility of the approaches into the danger area. The sentry shall have radio communications with the senior person on site.

8.8 Detector/ Locater Test Area

Each demining worksite shall have a testing area in order to ascertain the detectors or locators serviceability and its ability to clear to the required clearance depth, prior to the deminer moving into the suspected hazard area. The testing area shall be made up of two 1m x 1m areas, each measuring x 0.5m deep. The first area shall be totally metal free, whereas the second area shall also be metal free with the exception of the relevant test item (specific site threat), placed at the required clearance depth.

Following the normal setting up and calibration the detector/ locator shall be initially passed over the metal free area where no audible signal should be heard or seen and then over the area with the test item has been buried where an audible or visual signal should be heard or seen.

9. Metal Collection Pit

All metal removed from the mined area shall be placed within the metal collection pit. The pit should be dug approximately one metre square and 50 centimetres deep at a suitable location behind the clearance lane.

10. Mine/ERW Debris Pit

All mine/ERW debris removed from the hazard area shall be placed within a mine/ERW debris pit. The items remain in the pit until certified as Free From Explosive (FFE) content by qualified EOD personnel. A one-metre square, 50 cm deep pit should be located away from the mined area.

All FFE items shall be taken from the site and secured at a central collection point or designated place. EOD level 3 qualified staff shall then certify that the items are FFE. Back-loading instructions will be distributed once sufficient quantities are ready for disposal at an approved landfill site.

Clearance organisations retaining FFE mines or ERW for training aids shall maintain an accurate register of all items.

11. Latrine

A specific area shall be established for a latrine at each clearance site. This is fundamental for hygiene and will also prevent people inadvertently straying into mined areas. Latrines should be located in the vicinity of the rest area and at least a minimum of 50 metres from an unclear area. The number of personnel on the site should determine the number of latrines required per site.

12. Site Reference Points and Control Markers

a) Bench Mark: Bench Mark is a clearly identifiable fixed marker on the start line, from which all mine/ERW measurements are taken.

b) Base Line: Base line is a fixed line referred to from the datum point. This line is the dividing line between the mine/ERW area and the safe area. The Base Line shall never move. The initial Start Line will usually coincide with this line.

c) Safe Lane: Safe Lane is the area from which mine/ERW clearance starts. This area shall be free from mines or ERW, and is normally adjacent to the Base Line. The safe lane shall be a minimum of two metres wide

d) Start Line: The line from where mine/ERW clearance begins. As the clearance progresses into the minefield this line may be moved forward into the area which has been cleared of mines.

e) Start Point: Start Point is the point where a deminer begins mine/ ERW clearance. The Start Point is the location where each clearance teams starts work in their clearance lane.

f) Clearance Lane: Clearance Lane is the lane where a deminer is physically working, also known as the working lane.

g) Cleared Lane: Cleared Lane is a lane that has been cleared of all mines/ ERW and is normally free of all metal contamination.

h) Intermediate Line: Intermediate line is a line forward of the Start Line where cleared lanes finish and new clearance lanes begins. Intermediate Lines should be numbered successively, progressing forward, away from the Start Line.

i) Landmark or Reference Point: is a permanent fixed feature or building, outside the mine/UXO suspected area, from which all measurements to the benchmark are made.

13. Setting Out the Base Line

Where possible existing linear features such as roads paths and cultivated land should be utilised for setting out the base line. However, when a base line is required to be cleared, it shall be on the forward edge of a cleared/safe lane. This base line shall be a minimum of 2 metres wide.

14. Clearance Lanes

Lanes in which mine clearance teams are actually working may be marked with mine tape/ rope and eyelet pegs, laid along the ground to the left and right of the working lanes. The limit of clearance into the lane is marked with a base stick/painted red and white rocks. The first clearance lane into any mined area should be marked on the safe side in a similar way to the start line (If the lanes are worked from left to right, the left hand side is safe). The cleared part of the clearance lane shall be marked with pickets/painted rocks every 2 metres. On completion of the clearance lane, the pickets/painted rocks on the safe side can be removed.

15. Found Mine or ERW

When a mine/ERW is located, it shall be marked by placing a mine marker in front of the mine. If immediate destruction is not possible, the clearance lane should be closed off and a new lane commenced from the start line. The mine/ERW shall be destroyed at the end of the day.

16. Minimum Safety Distances

Table 1 shows minimum, recommended working distances between demining staff at a worksite where mines present the greatest hazard. Greater working distance should be considered where it is possible to use them without reducing efficiency.

If any of the following apply the distances shown under the heading increased risk in table 1 should be applied as a minimum.

a) Hazards in the area are unknown or in unpredictable conditions.

b) There is reason to believe that hazards may be booby trapped or have anti lift devices fitted.

c) The processes in use have not been proven in a similar context.

d) The likelihood of an unintended detonation has been assessed as increased.

When the risk assessment determines that ERW present the greatest hazard, working distances appropriate for the risk of unintended detonation of the ERW should be determined and applied. When there is no reason to believe that the procedures and tools in use could cause an unintended detonation of any hazard present, the working distance for the normal risk associated with the smallest AP blast mine should be adopted. Having determined which mine presents the greatest hazard with regards to its type, condition and context, the working distance shown in the table below shall be applied as a minimum. Any further reduction shall be documented in the risk assessment with reasons for the variation stated in writing. Greater distances should be used when a demining group own risk assessment determines that greater distances are desirable.

Mine type	Minimum distances between demining personnel (distance in meters)	
	Normal Risk	Increased Risk
AP blast HE up to 200gm	10	15
AP blast HE more than 200gm	15	20
AP fragmentation mines	20	25
AP bounding or directional fragmentation mines	25	30
AT mines	25	50

Notes to Table:
1 Recommended minimum distances are for demining staff wearing AMAS 22 compliant PPE
2. The type of mine selected to determine the minimum working distance should be the most hazardous functional mine that could be initiated using the demining tools and processes that will be used.
3. the risk assessment used to determine the minimum working distances shall be reviewed if any of the information used in the assessment changes
4. If devices representing a greater hazard than expected are discovered, the appropriate working distances for the increased hazard shall be adopted unless there is no reason to anticipate the presence of more of those devices in the area
5. these distances should not be applied during demolition or any other procedure during which mines are deliberately detonated (such as mechanical demining)
6. Generally, working distances do not apply to those supervising deminers while they work. It is a safety requirement that supervisors may approach any working deminer as part of their task. Supervisors should not approach closer than three meters while a deminer is working.