

## **11. MINE CLEARANCE TECHNIQUES**

### **1. General**

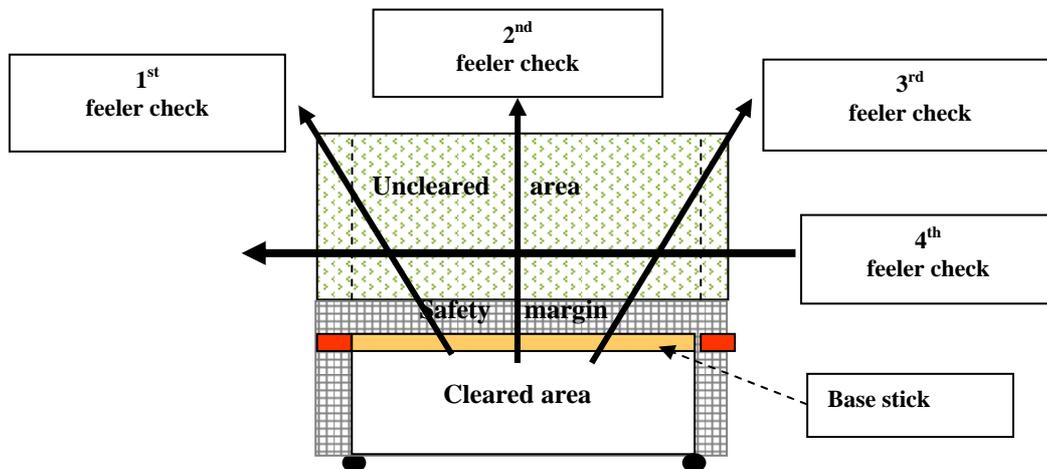
Mine clearance techniques for each task may differ, depending on the vegetation, soil content and type of mines, etc. However, the following sequence is a recommended basic manual demining procedure for use in clearance lanes:

- a) Visually and manually inspect the area in front of the Base stick for tripwires, UXOs, surface-laid mines, protruding fuses or suspicious objects;
- b) Using a tripwire feeler, search for tripwires;
- c) Clear vegetation as required, using a small pruning tool or garden shears;
- d) Carry out two controlled sweeps with a metal detector over the entire width of the clearance lane, from right to left then back to right and forward to a maximum of one full search head. Detector head has to overlap one full search head sizes into the lanes at each side;
- e) If the detector gives no signal, move the base-stick 20sm forward and repeat the process from sub paragraph (a);
- f) Re-check the area with the detector after any fragmentation is removed or where excavation occurs;
- g) If the detector gives a signal, mark with a mine-marker 15 cm back from the location of the signal and use a manual demining prodder to locate the source of the signal. Once the object is located, a small hand-trowel should be used to excavate the earth, starting from 20sm back from the signal towards it, in order to accurately reveal its model. Only sufficient excavation should be conducted to identify the object.;
- h) If a mine or UXO is uncovered, a mine marker is to be placed next to it. Stop mine clearance and immediately inform the Section Leader;
- i) All other metal objects should be collected into deminers' plastic buckets and delivered to the metal collection point at the completion of the deminers' shift or as required.

This is a general outlines of the procedure. All procedures and drills, used in clearance lanes, are to be fully and clearly explained in relevant SOPs.

## 2. Detection of tripwires

If vegetation permits, a 75cm-long tripwire feeler must be used to locate tripwires. This should be made from light-gauge wire and constructed with a loop in the end of it for the



operator to use it. Starting from a standing position, the tripwire feeler is moved left, center, right and then sweeping from right to the left.

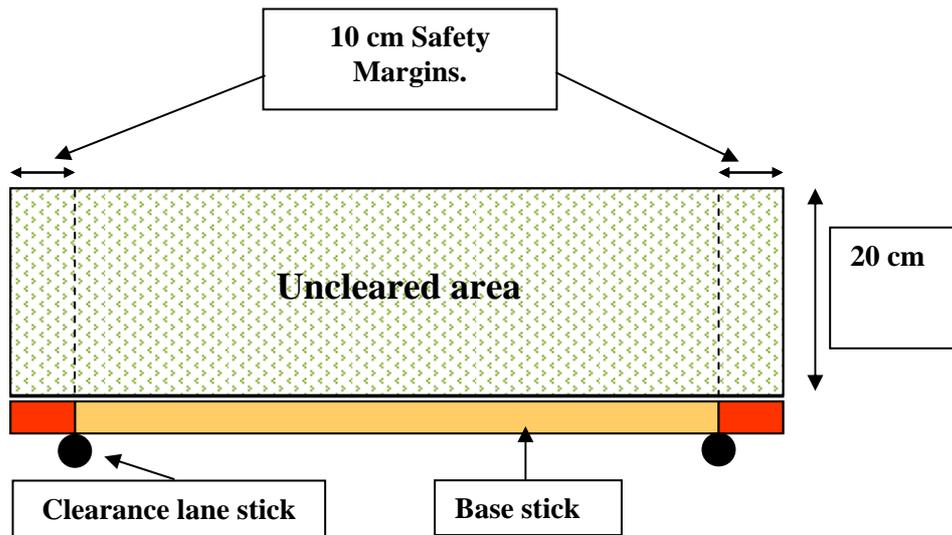
If vegetation does not allow the use of a tripwire feeler, the visual search is performed. After a thorough visual check of the area, search the area slowly moving the hands forward, gently parting any thick vegetation that may obscure tripwires.

## 3. Clearance of vegetation

The clearance of vegetation is to be done in a safe and controlled method, avoiding any disturbance of vegetation outside the width of the lane. One hand is to secure the tree, branch, or clump of vegetation, while the other uses the cutting tool. All vegetation is to be cut to 5cm or below and laid either in the adjacent cleared lane or behind the deminer, if starting a new lane.

## 4. Use of the metal detector

Before commencing the sweep of the area, the deminer should check the function of the metal detector. The sensitivity of the metal detector is to be checked in accordance with the manufacturer's manual. Two complete passes are to be made over the area in front of the base stick, each pass is to overlap and extend one search head width (20 cm) outside the lane boundary. Details are explained in relevant SOPs.



### **5. Use of the prodder**

Once an accurate signal point has been established with the metal detector, the prodder is used to identify the cause of the signal. Prodding is to commence one hand span (minimum 15 cm) to the rear of the signal point and to a width of 30cm (depending on the size of the signal). The prodder, at an angle of 30 degrees, is then inserted into the ground at intervals of 5 cm. Minimum lengths of the prodder is to be 40 cm. The prodder is to be used with an even motion, avoiding any excessive force or stabbing. In hard soil, water may be used to soften the ground before prodding commences.

### **6. Use of the trowel (Excavating or Sapping)**

After identifying the location and size of the suspected item, the hand-trowel is used to excavate the soil to reveal the item. Once a small hole is made 20cm back from the suspected object, the hand-trowel is held on the side of the hole and used to slowly remove the soil until the object is revealed enough to identify. The soil is removed to a depth of at least 20cm, whilst avoiding any downward pressure with the trowel. The digging motion has to be sidewise and never up or down. Verify both the excavated soil and the trench randomly with the mine detector.

If an object is not located after using the prodder, the cause of the metal detector signal may be either a deeply buried metal object or a small fragment. The trowel must still be used to remove the soil and locate the object. The minimum depth of excavation will be 20cm. The maximum depth of excavation is to be decided by the Section Leader and approved by the Team Leader.

### **7. Action on locating a tripwire**

Upon the location of the tripwire, the deminer is to stop mine clearance and notify the Section Leader. The Team Leader is responsible for ensuring that both ends of the tripwire are cleared. Normally, a one meter wide lane is cleared parallel to the tripwire, no closer than 50cm to the wire, to locate both ends. At no point is the tripwire to be disturbed or cut until both ends are cleared safe.

*Note: All personnel must maintain safe distance till the ends of the tripwire are reached, and the item is removed/disposed.*

### **8. Action on locating a mine**

The deminer is to stop mine clearance and notify the Section Leader. The Team Leader is responsible for all actions, related to the removal/destruction of the mine.

The lane is closed and mine clearance activities will be started in a new lane, unless the mine is removed.

Unless the situation prohibits, all mines and UXOs are to be destroyed in situ. If this is not possible, the mine will be remotely pulled before handling. Destruction of located mines/UXOs will be carried out at the end of each day or at a prearranged time daily. Mines are not to be stored or transported overnight prior to their destruction. All mines will be destroyed on the day that they are found, unless a specific safety hazard prevents this. Where mines are not destroyed on the day they are found, ANAMA HQ is to be informed before work ceases on that day.

### **9. Action on locating of UXO**

The deminer is to stop clearance and notify the Section Leader. The Team Leader is responsible for all actions, related to the removal/destruction of the UXO in situ. All UXOs are to be remotely pulled before handling.

### **10. Pulling procedures**

When it is necessary to remotely pull a mine or UXO, the Team Leader is responsible for the pulling sequence. All personnel, not involved in the pulling operation, are to be withdrawn to a safe area. A pulling cable is to be rolled out from a safe point, a minimum of 50 meters away (the distance may be increased depending on the type of mine/UXO), to the location of the mine or UXO that is to be pulled. This cable is always to be rolled out before it is attached to the object.

After the personnel have withdrawn to the safe area, a hook or loop is attached to the mine or UXO. The item is pulled in a slow, continuous movement, avoiding any sharp jerking. A minimum soak-time of 2 minutes is to be allowed before approaching the mine or UXO. The type of UXO or mine being pulled will dictate requirements for extension of the soak-time.

The original position of the mine or UXO is to be verified with a metal detector for any further readings.

### **11. High metallic areas**

In areas, where the metallic content of the soil is high, the metal detector may be ineffective. The detector procedure must be replaced with a complete prodding and/or excavating procedure.

### **12. Burning uncleared areas**

To increase visibility for the deminers and mine clearance rates and safety, uncleared areas have to be burnt prior to clearance at the discretion of the supervisor and in coordination with local authorities. However, supervisors must exercise good judgment, as burning uncleared

areas may cause damage to neighboring agricultural land or alter the stability of unexploded ordnance. A minimum soak-time of five (5) days is to be allowed between burning of the area and commencement of the clearance operations.

*Note: During all stages of burning operations, personal protection equipment must be worn.*

**13. Mine Detection Dogs (MDD) Support**

Details are contained in a separate chapter of these standards.

**14. Mechanical Demining Machine (MDM) Support**

Details are contained in a separate chapter of these standards.