

# AMAS 13

Second Edition  
August 2007

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## Battle Area Clearance

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## Contents

AMENDMENT RECORD.....	4
MANAGEMENT OF AMAS AMENDMENTS.....	4
13.1 INTRODUCTION .....	5
13.2 SCOPE .....	5
13.3 CLUSTER MUNITIONS .....	5
13.4 METHODOLOGY .....	6
13.5 CLUSTER MUNITIONS WITH DRAG RIBBONS .....	6
13.6 CLUSTER MUNITIONS CLEARANCE DEPTH.....	7
13.7 PHASE I: VISUAL SEARCH .....	7
13.8 CONDUCT OF THE SEARCH .....	7
13.9 ADDITIONAL SAFETY POINTS .....	8
13.10 RECORDING & REPORTING .....	8
13.11 PHASE TWO: INSTRUMENT SEARCH .....	9
13.12 CONDUCT OF THE SEARCH .....	9
13.13 RECORDING & REPORTING .....	10
13.14 INDIVIDUAL ITEMS FOR DESTRUCTION:.....	10
13.15 RENDER SAFE PROCEDURES (RSP).....	10
13.16 PERSONAL PROTECTIVE EQUIPMENT (PPE) .....	10

### **Warning**

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## Battle Area Clearance

### 13.1 Introduction

13.1.1 All areas within Afghanistan that are known to contain a mine/UXO hazard are marked and recorded as a Suspected Hazard Area (SHA) on IMSMA. A number of these SHAs will contain a mine hazard and the procedure for clearance of these areas is detailed at AMAS 11. However, many SHAs will not contain mines and the threat will be unexploded cluster munitions, unexploded Land Service Ammunition (LSA) or unexploded air delivered weapons. Battle Area Clearance (BAC) is the term used to describe the systematic search and clearance of all items of ordnance and munitions within a given area.

### 13.2 Scope

13.2.1 This chapter provides technical guidelines and procedure for clearing unexploded ordnance (UXO) including cluster munitions contaminated areas.

### 13.3 Cluster Munitions

13.3.1 Cluster munitions are delivered by a wide variety of launch or delivery systems, such as missiles, rockets, projectiles, mortars or aircraft dispensers. Once the dispenser has been fired, launched or dropped, opening is normally determined by a time delay or proximity fuse. The sub munitions are normally dispensed in one of three ways; base ejection, nose ejection or case rupture. Since sub munitions disperse after ejection, the density of the impact footprint is dependent on the speed and altitude at which the dispenser, projectile or rocket opens. (See Figure 14.2 – Example of Cluster Strike Footprint.)

13.3.2 The munitions currently found in Afghanistan are designed to detonate upon impact. The failure rate of these cluster munitions cannot be accurately determined until such time as the necessary strike data is provided. Notwithstanding this, failure rates are dependent on a number of factors such as:

- a) Design,
- b) Length and condition of storage,
- c) Drop height and velocity,
- d) Vegetation and
- e) Ground conditions at the impact area.

13.3.3 Threat to the Local Community: Cluster munitions and UXO pose a direct threat to communities and internally displaced people, hamper humanitarian relief, hinder the already difficult task of reconstruction of houses and essential infrastructure and impede movement of peacekeeping troops.

13.3.4 The method of search or clearance of cluster munitions will depend on the threat to human lives; this will initially be in built up areas, along roads, around houses and gardens, schools and public buildings. The immediate priority is to save lives and minimize the likelihood of injuries due to the presence of cluster munitions. An equally high priority is to save livelihoods such as clearance of plantations, as well as olive and fruit orchards, this will facilitate economic productivity and minimize the risk to local people attempting to remove cluster munitions themselves.

13.3.5 The procedures given in this chapter provide the foundation and framework from which each clearance organization is to base detailed clearance procedures. These

procedures are to be concisely stated in the respective SOP's with clear explanations and if necessary with diagrams and sketches.

13.3.6 Site setup for a BAC task is as per AMAS Chapter Six, Site Preparation and Setting Out.

## **13.4 Methodology**

13.4.1 Once a cluster munitions strike area has been identified it is entered into IMSMA and recorded as a target in the form of a SHA Report. All targets will be prioritized based on the threat to human life and livelihood, and will be cleared accordingly.

13.4.2 The methodology for the clearance of cluster munitions strike areas should employ a two phase approach, whereby as a means of rapidly removing the immediate and obvious cluster munitions threat which pose the greatest risk to human lives, a visual search is conducted (Phase I). The visual search is without instruments and is generally non-intrusive; it is intended to identify for removing those bomb lets in the immediate vicinity of built up areas and places of highest threat.

13.4.3 During the visual search the site supervisor is responsible to ensure that strict control is maintained and the area is thoroughly investigated. Those items that are to be destroyed in situ shall be clearly marked and the local population warned of the threat. If required, protective works are to be employed in order to minimize damage. Safe to move items can be neutralized and moved to an approved CDS. In addition to the removal of the immediate threat, the site supervisor shall determine as accurately as possible the center of the cluster strike and record the Lat/ Lang. This information will be used during the next phase of clearance which will be a systematic subsurface search using instruments (Phase II).

13.4.4 It should not be assumed the same team or indeed the same clearance company will revisit the site and conduct the Phase II sub surface clearance. It is therefore vitally important that all information gathered during the Phase I clearance is complete, accurate and recorded clearly in order to minimize confusion and the potential to leave areas within a cluster munitions site unclear.

13.4.5 The purpose of the Phase II instrument search is to systematically search the entire cluster strike area (sub surface) with instruments. The information gathered during the Phase I visual search will be used to assist with the Phase II planning. The aim of this phase is to clear from the task site all bomb lets both surface and subsurface until fade out has been achieved.

## **13.5 Cluster Munitions with Drag Ribbons**

13.5.1 Those munitions with a drag ribbon such as the KB-1, KB-2, M42, M46 and M77 are prone to catching on trees, bushes and fences. It is therefore essential that all searchers are aware of the potential danger of hanging munitions and take appropriate precautions.

13.5.2 Trees because of their shape and large leaves will require additional consideration to ensure no cluster munitions are left undiscovered in the tops.

13.5.3 Clearance of cluster munitions hanging from trees or fences will be challenging and should be dealt with on a case-by-case basis. Those that are considered safe to move, may be moved to an approved disposal area. However those considered unsafe to move will require special attention and in these situations the MACCA/AMAC is to be informed.

13.5.4 Clearance organizations are required to have specific procedures to deal with cluster munitions caught in vegetation and fences.

13.5.5 Wind speed at the task site should be considered when conducting clearance as this may disturb those munitions with drag ribbons and parachute assemblies, causing them to detonate.

### **13.6 Cluster Munitions Clearance Depth**

13.6.1 The default depth for cluster munitions clearance in Afghanistan is 13cm. However there is scope for this to be adjusted and a site-specific clearance depth can be agreed to between the clearance organization and the MACCA/AMAC. If there is a deviation from the 13cm clearance depth then the reason for the change in depth shall be explained and then formally recorded in the clearance plan for each site.

13.6.2 The default depth for cluster munitions will remain at 13cm until such time sufficient evidence has been gathered during the course of clearance to suggest this depth is inappropriate, and the depth will then be adjusted accordingly.

### **13.7 Phase I: Visual Search**

13.7.1 Visual search is the most effective method of rapidly locating, removing and/or destroying the immediate threat of cluster munitions from a contaminated area. The terrain, density of vegetation or habitation will determine the maximum number of searchers and safety spacing of individuals within the search party. Work parties shall not search continuously for more than 60 minutes without at least a 10 minutes rest period.

13.7.2 A dependable method of systematic visual search shall be employed to ensure all areas are investigated thoroughly and no items on the surface are left undiscovered. Command and control of each site is the responsibility of the site supervisor, this may become more problematic particularly in built up areas. Therefore consideration should be given to the overall site and threat posed, with an appropriate response thought-out. Alternate search methods may need to be employed dependent on the area searched, i.e. open fields, plantations/orchards, or built up areas to ensure all cluster munitions and items of ordnance are reliably located.

### **13.8 Conduct of the Search**

13.8.1 Any number of searchers may be employed in an area provided that appropriate command and control is in place, and a minimum safety distance of 50m is maintained between each search party. Searching shall always be carried out in complete silence, except for clearance instructions and on the identification of a cluster munitions or UXO by a search party member. But for open area surface search, the team works in an extended line with **one** to **three** meters between each searcher, depending on the terrain being searched. Mark and identify all UXO that the team finds. The extended line will make as many passes as necessary to insure that the area has been searched 100%. As with the urban search at the end of the days work, the team and section leaders will inspect all UXO items found and confirm the munitions by type. They will also classify them as safe or unsafe to move and report them to the Explosive Ordnance Disposal (EOD) Team, and record all detail. Any UXO encountered that is outside the scope of the team and section leaders training will be marked and reported to EOD for further action.

13.8.2 Any search party member who identifies an item of cluster munitions or UXO is to

immediately alert the remainder of the party and supervisor or TL. After an evaluation by the supervisor the cluster munitions or UXO is to be suitably marked.

13.8.3 The “search line” is to progress forward and cover the full width of the threat area in a systematic manner to ensure all items are located. Once an area has been searched and all cluster munitions and UXO marked, the party can then move onto the next area within the cluster strike site.

13.8.4 The visual search can be either intrusive or non-intrusive. If there is no requirement to move vegetation, rubble, soil or any other object that could be concealing a cluster munitions (non-intrusive) then there is no requirement for PPE to be worn. It is applicable for other UXO, but not in BLU-97 and other sub munitions strike areas. Full PPE should be worn if there is a requirement to move items (intrusive). **No sub munitions will be moved if it can be blown in situ. If it is required to be moved and is unarmed, then it can be moved a short distance to a disposal area – person-carrying sub munitions will be wearing full PPE.**

13.8.5 All items located are to be either destroyed in situ or if determined safe to move, recovered to a CDS for demolition. Close liaison with the local community and any other organizations working in the immediate vicinity is to be maintained when conducting demolitions particularly in built up areas.

13.8.6 The Lot/Lang detailed in the issued SHA Report is not necessarily the center of the cluster strike, and for that reason during the course of clearance the site supervisor is responsible for identifying as accurately as possible the center of the cluster strike. This new Lot/Lang will assist the site supervisor of the subsequent Phase II clearance operation to ensure the entire strike location is systematically investigated and appropriately cleared.

## 13.9 Additional Safety Points

13.9.1 These additional safety points will be strictly adhered to at all times.

- a) Before any work begins the supervisor is to establish a Medical Aid point and position the ambulance, or appropriate type of vehicle adjacent to the task point the location of nearest hospital or FMU is to be known and the route to be established. If at any time during the search, mines tripwires or suspicion of mines are discovered, the task will immediately will be stopped the relevant safety precautions observed and the facts reported to the regional AMAC manager.
- b) If during the conduct of the search an ammunitions or explosive storage area or an ammunition dump which has been damaged by direct fire or there is high density of UXO in a small area, is located these areas must be cordoned off and reported to the AMAC for the EOD team to be tasked all times.
- c) During the conduct of the search a breaching pair equipped with a detector, PPE and a prodder will be on standby in the event of a mine incident. This breaching pair shall be positioned 25m behind the section leaders and move team at all times.

## 13.10 Recording & Reporting

13.10.1 The location of all discovered cluster munitions and confirmed strike marks are to be recorded for future reference, which will ensure a more accurate and defined representation of the strike location and facilitate the subsequent Phase II clearance.

13.10.2 An important consideration for Phase II clearance is that once all visible surface cluster munitions are removed during Phase I, it then becomes very difficult to accurately determine the extent of the cluster strike unless the information is suitably recorded during this Phase I clearance.

13.10.3 The minimum requirement for reporting of the completion of Phase I clearance shall return the issued Task Dossier with the additional information as follows:

- a) IMSMA Suspension Report accurately filled in detailing the SHA number, location, work conducted, explosives used, type and number of items destroyed including a site sketch depicting the Reference Point, the area searched including the general location of the cluster munitions located,
- b) All daily logs,
- c) Accurate Lot/Lang of the assessed center of cluster strike (to be annotated in the Suspension Report),
- d) Visitors log,
- e) Internal QC reports and
- f) Any other information that will assist the Phase II clearance.

### **13.11 Phase Two: Instrument Search**

13.11.1 The Phase II instrument search is normally subsequent to the Phase I visual search, however there may be situations whereby clearance will be a combination of visual and instrument search. Nonetheless those instruments employed must be able to reliably locate cluster munitions to a minimum depth of 20cm. The type of locator/detector used will depend on the task site, i.e. large-loop detectors are very effective in large open fields but limited in areas with high vegetation where a probe type detector is more effective.

### **13.12 Conduct of the Search**

13.12.1 The method used to conduct an instrument search will be dependent upon the location of the task, i.e. built up areas, agricultural or open fields. The method employed is to ensure each search/clearance lane and box is systematically searched and all readings are investigated. (See Figure 14.1 - Typical BAC box layout.)

13.12.2 Consideration is to be given to ensure that the search method employed does not allow detectors to interfere with one another. The site supervisor is responsible for devising a method that allows the maximum number of detectors to be employed whilst allowing for adequate separation in order to prevent interference. Suitable temporary marking is to be used during the instrument search to ensure the entire task site is methodically searched. The marking system is to be easily identifiable, unambiguous and should clearly differentiate between areas cleared and unclear. The marking system for the search lanes is to be such that it is easily and quickly moved as the search

13.12.3 The size of the search boxes is the responsibility of each clearance organization, however the size should allow for an effective systematic search without causing unnecessary delays with time spent erecting marking. The searchers are to ensure the entire width of their respective search lanes are systematically searched including an

allowance for a safety overlap to each side of the lane. Upon locating a sub-surface signal, normal demining excavation drills are to be employed. A minimum safety distance of 25m between excavation deminers is to be observed.

13.12.4 Fade out will be achieved once a minimum distance of 50m has been cleared past the last located cluster munitions. Before the team departs from the site the MACCA/AMAC Operations Officer is to be informed and an onsite assessment conducted to confirm that no other clearance is required. During this time any area within the task site that has not been cleared will be reviewed discussed and agreed upon. If the area is to remain unclear then it will be determined how the area is to be permanently fenced and marked.

### 13.13 Recording & Reporting

13.13.1 Each completed BAC task site will be subjected to the same recording and reporting procedures issued in the task folder. It is essential that the area cleared is marked and Accurately Recorded. For more details refer to the reporting chapter of the AMAS.

### 13.14 Individual Items for Destruction:

13.14.1 All items considered safe to move can be destroyed at an approved CDS; those items unsafe to move are to be destroyed in situ. For destruction in situ adequate precautions are to be taken to mitigate against unnecessary damage to property and infrastructure. If required protective works are to be employed.

13.14.2 The MACCA/AMAC as well as local residents and concerned parties are to be informed that a demolition will occur with as much notice as possible. Normal safety measures are to apply particularly the cordon of the site with sentries. Precautions are also to be taken to reduce the risk of fire as a result of demolitions. All concerned parties are to be informed once the demolition has been successfully completed.

13.14.3 A major factor that should always be considered during the disposal of sub munitions is the danger posed by the formation of the jet from the shaped charge. Shaped charge jets have the potential to fly over 1800m in free air. Therefore every attempt should be made to degrade the performance of this jet. This is usually achieved by placing the donor charge in such a position that it also attacks the integrity of the cone liner. An alternative is to place a robust barrier in front of the sub munitions to degrade the charge

### 13.15 Render Safe Procedures (RSP)

13.15.1 Each organization is to establish RSP for cluster munitions. If an organization is conducting manual disarmament of the fuse then this procedure is to be clearly explained in a step-by-step manner incorporating diagrams and/or photographs. **No RSPs will be conducted using any procedure that has not been accredited by MACCA EOD Technical Advisor.**

### 13.16 Personal Protective Equipment (PPE)

13.16.1 The minimum PPE to be worn whilst conducting intrusive visual and instrument-aided surface search is safety glasses and protective vest. **Visual searching and marking of an open area (NOT in areas of BLU-97 or other sub munitions strikes), PPE vest is necessary and a minimum of approved safety glasses, but the visor is not required.** For normal searches of a battlefield, where all UXO or ammunition items are likely to be scattered on the surface over a wide area, use of a visor can restrict the vision of

the searcher and small items of explosive ordnance (for example partly buried fuzes and 23mm HEI shells). It is necessary to wear the protective vest, as the risks of accidental initiation of a UXO are low.

13.16.2 If there is a requirement to investigate a sub-surface signal and excavate then the minimum requirement is protective visor and protective vest.

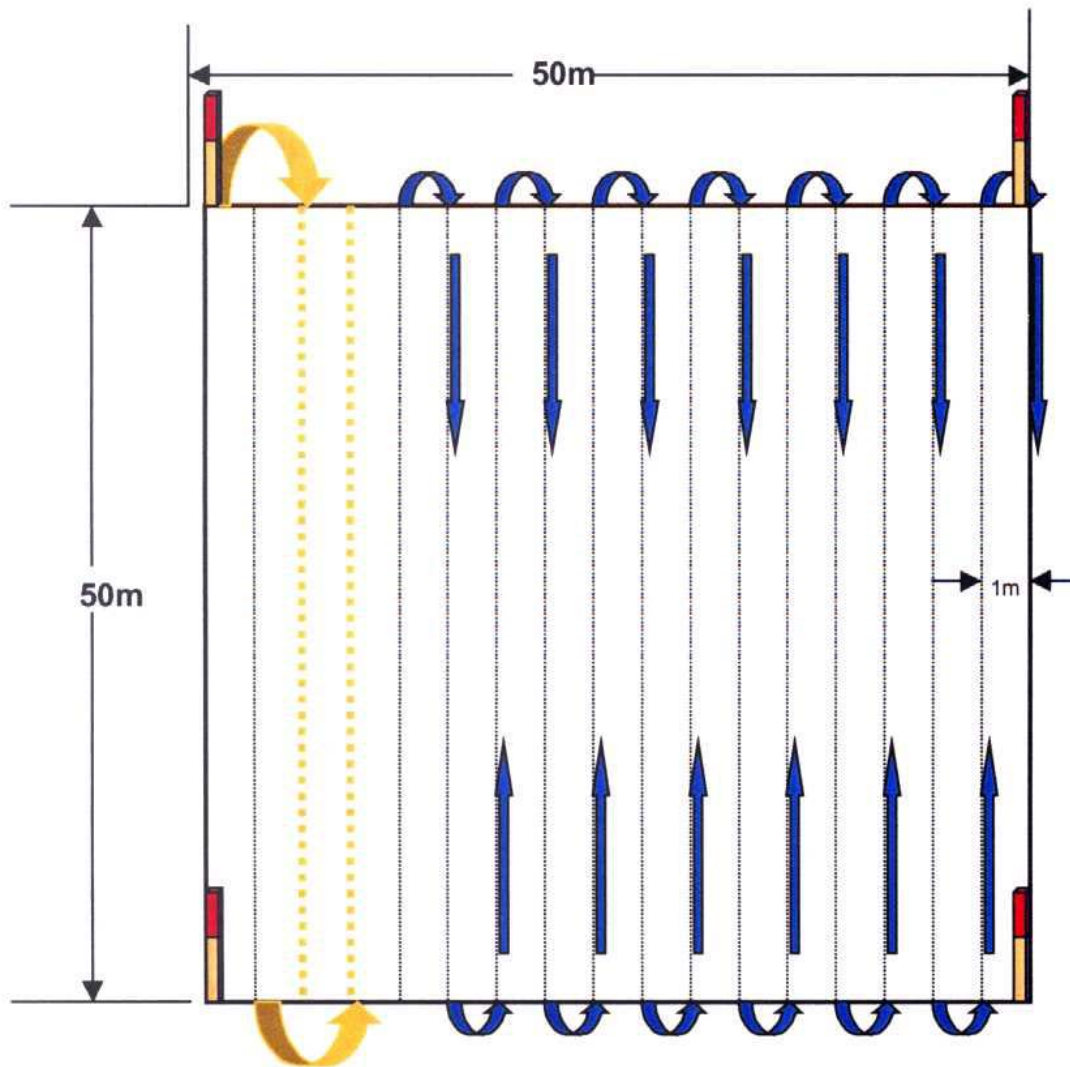


Figure 13:1 Battle Area Clearance Box Layout

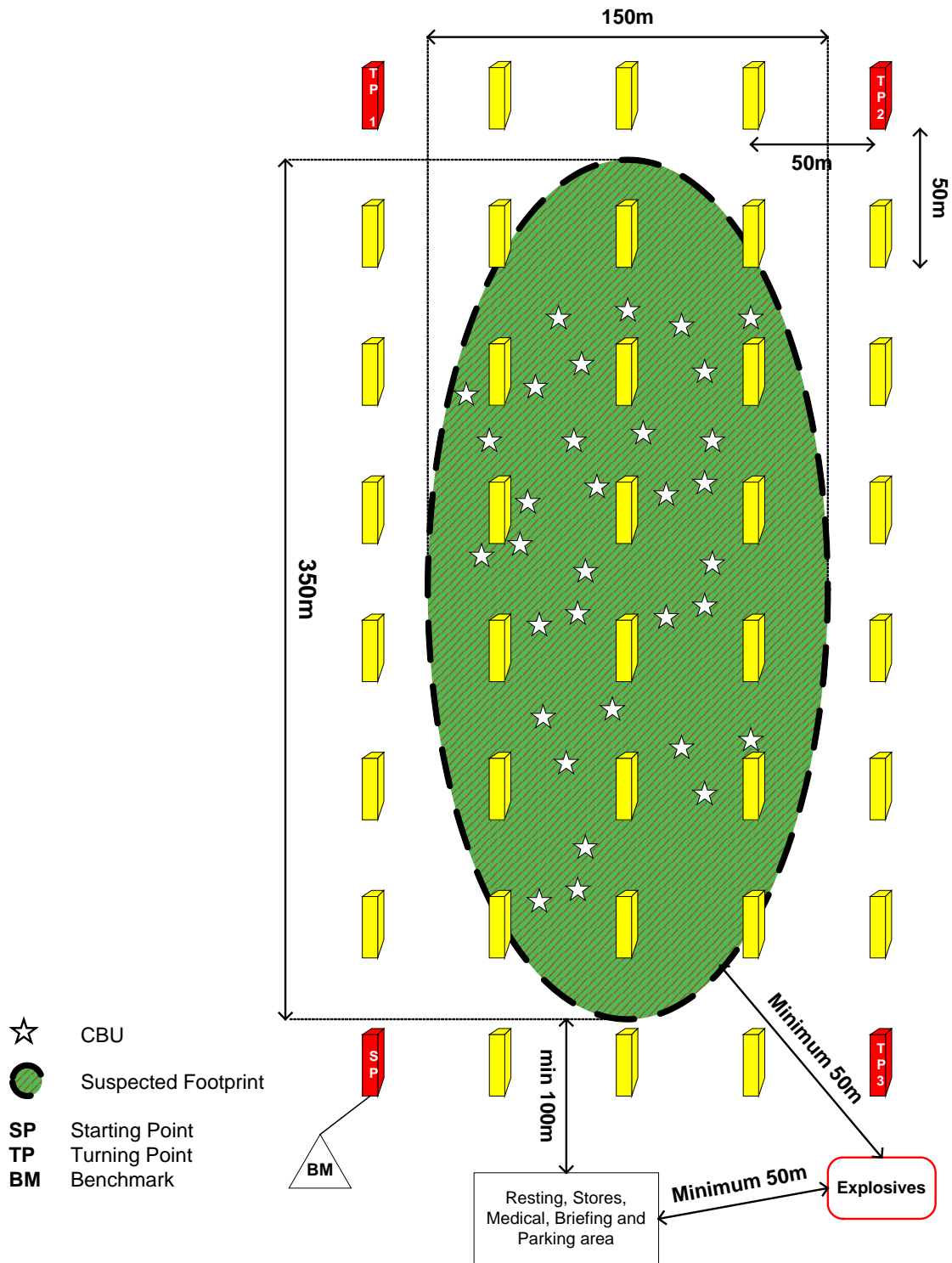


Figure 13:2 Example of a Cluster Strike Site Footprint