
GENERIC SOPs

CHAPTER 8: MINE DETECTING DOGS

Date:



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1. General

MDD procedures are a part of an integrated mine Clearance approach that aims to achieve a standard of Clearance in compliance with the International Standards for Mine Action (IMAS). To achieve this, MDD must be purchased from an internationally respected source with proven expertise in the effective training and preparation of MDD.

Appropriately trained MDD can be used to conduct Area Reduction and to verify that land believed to have No Known Threat is in fact free from explosive devices. Male MDD are usually selected because they have fewer unproductive days in any month.

The way in which MDD are deployed is based on field experience and has very limited flexibility. However, all tasks are different and the procedures described in these SOPs have been developed to maximise the use of MDD in a varied context. All variations to the actual procedures given in these SOPs must be approved by the MDD Coordinator *before* implementation.

The MDD Coordinator and MDD Handlers must demonstrate the ability to analyse complex situations and make reasoned judgements that limit the use of MDD to areas in which there is complete confidence in their ability. The MDD Coordinator must make the final decision over whether a task can be conducted by an MDD Team.

These SOPs presume an integrated use of demining assets that are detailed in a Task Release Plan before implementation. The use of MDD in the Task Release Plan must be approved by the MDD Coordinator before the plan is finalised

1.1 How MDD can be used

MDD must have been trained to search for explosive targets in or on ground similar to the Task area. The MDD can only reliably locate the targets that they have trained to search so they must not be used when they have not been trained to find the relevant targets.

To complete their basic training (and provide refresher training) MDD training areas must be established and the appropriate targets concealed. MDD Sets must be trained in the MDD Training Areas until their performance gives full confidence of their ability to work in the Task area.

NOTE: *An MDD Set is an MDD and its Handler. A Handler may have two dogs, each of which is a separate MDD Set. An MDD Team comprises one or more MDD Sets and sufficient deminers and support staff under the control of an MDD Team Leader.*

MDD Sets are frequently used for wide-area searches in order to locate random mines or lines of mines. When the pattern(s) of the mined area are known, MDD Sets can be used to search for any mines that are missing from the pattern. MDD Sets can also be used to confirm the absence of threat from any area.



The MDD must concentrate at all time while it works.

2. Deployment of MDD teams

In general MDD Teams may be deployed for the following tasks:

1. Technical Survey, including making breaches into and outside the SHA/CHA. MDD should be withdrawn as soon as mines are found and not redeployed until there is confidence that any concentration or cluster of mines has been passed;
2. area search in areas of Low Threat or No Known Threat (where no mines are anticipated);
3. area search in areas of where isolated missing mines or nuisance mines are anticipated;
4. internal Quality Control tasks over areas first searched with other methods; and
5. after mechanical ground processing.

MDD Teams cannot be deployed unless the MDD Coordinator approves their use. This decision will be made with reference to:

1. the MDD Set's training and state of readiness;
2. the weather;
3. the anticipated hazard(s) and the Task Assessment;
4. the efficiency of the use of MDD (compared with other available assets);
5. an assessment of safety. MDD must not be used on any task where the MDD Coordinator (or deputy) are concerned about the safety of the MDD; and
6. the ground conditions at the Task.

The deployment of MDD Teams is further constrained by the restrictions listed under Part 2.2 in this Chapter.

2.1 Potential MDD Tasks

When the correct conditions are met, MDD Teams can be used to perform the following searches. In all of them, as soon as mines or ERW are discovered, manual assets should be deployed.

1. An MDD team using two MDD Sets may be deployed to confirm the absence of hazards in areas defined as having No Known Threat. Linear cross-country tasks, such as the proposed route for a new road, railway or pipe-line fall into this category.
2. An MDD team using two MDD Sets may be deployed to confirm the absence of hazards in areas defined as Low Threat or areas defined as High Threat *after* the anticipated mines have been found and Cleared.
3. An MDD team using two MDD Sets may be deployed to search for missing mines in areas where mines may have moved.
4. An MDD Team using two MDD may be deployed to confirm the safety of land following mechanical ground preparation where no detonations have occurred and there is no visible indication of a hazard.
5. An MDD Team using two MDD may be deployed to locate the borders of areas where mines have been broken or detonated following mechanical ground preparation where detonations may have occurred (after an appropriate length of time has passed).
6. An MDD Team using two MDD sets that has been trained to do so may be used to prepare breaches into the SHA/CHA (subject to the constraints listed under Part 2.2 in this Chapter).
7. An MDD Team may be used to search suspect areas identified using a REST system (after those areas have been suitably prepared by machines, when necessary).
8. Appropriately trained MDD sets may be used to search land inside ditches and trenches.
9. Appropriately trained MDD sets may be used to search low walls and piles of rock.

10. Appropriately trained MDD sets may be used to search buildings;
11. Appropriately trained MDD sets may be used to search vehicle wrecks and abandoned machinery; and
12. An MDD Team can also be used as a QA tool following manual Clearance of an area after a suitable time has elapsed so that the MDD do not signal where mines have been removed. This is usually at least five days.

2.2 Where MDD Teams cannot be deployed

MDD Teams cannot be deployed in the following situations:

1. When there is high wind which makes the position of indications unreliable. Acceptable wind speeds vary according to training, dust levels and available angles of approach. The MDD Coordinator and MDD Team Leader must judge whether the wind is too high for reliable MDD deployment. A weather station can be useful during both training and deployment.
2. During rain. This may be varied at the discretion of the MDD coordinator, making reference to the MDD Sets' familiarity with the prevailing conditions.
3. When the temperature is too low or too high. The acceptable temperatures must be determined by the MDD coordinator, making reference to the MDD Sets' familiarity with the prevailing conditions.
4. In areas where the MDD's paws may be injured or where its muzzle may become irritated. Such areas may be where there is thorny or sharp vegetation.
5. Where the ground is contaminated with high levels of salt or other chemicals.
6. Where there is vegetation that prevents the controlled movement of the dog over the area to be searched.
7. In areas with a high density of mines or explosive contamination.
8. In areas where the MDD is not visible to the Handler at all times during the search. The Handler must not begin a search over an area where he/she will not have full visual contact with the MDD throughout the entire search.
9. In areas with an insect infestation that is known to disturb the concentration of the MDD, or of the Handler.
10. In areas where intact tripwires are anticipated. Effective mechanical preparation of the ground can ensure that any remaining devices do not have intact tripwires.
11. Within five metres of the site of an explosive detonation unless a suitable time has elapsed. The time required must be determined by the MDD Coordinator with reference to experience gained in conditions similar to the Task area.
12. On any MDD Task, if the MDD indicates more than three times in an area ten metres square, the Handler must decide whether the dog may become confused by the number of odour sources. If so, the MDD Set must be withdrawn and the area processed using other methods (or another MDD Set).

MDD Teams may be used in the areas listed above when the restricting conditions have changed.

3. Safety rules and operational variations

All MDD Sets must have been trained to approved standards before they can be used in operational areas.

3.1 General rules for MDD deployment

The following are basic rules for MDD Set safety in all working scenarios:

1. MDD should be kept on a leash when in the operational area unless specifically trained for free running search.
2. The Handlers must visually check the working area before and during the work. If the Handler can see a mine or ERW in the search area, he/she must withdraw the MDD and inform the MDD Team Leader. The MDD Team Leader will generally ask the MDD Handler to use the MDD to confirm that the device is explosive unless it is a fragmentation device and may have an intact tripwire. When this occurs, the MDD set should work in another area while manual demining assets are used to breach into the device using approved manual demining processes.
3. MDD should not be left unattended in any situation when they are outside the kennel facilities.
4. All MDD Sets must complete a daily Capability Test before starting work at a Task. An MDD that does not pass the daily Capability Test must be withdrawn from search operations. The area(s) in which that particular MDD worked on the previous day must be searched again.
5. During the first search of an area that will be searched by two MDD Sets, the Handler must not walk in the searched area (must use a long-leash). Land is considered safe for the Handler to walk on only after a second search has been conducted. Because the Handler always walks on the searched side of a short-leash MDD, the second search can be conducted using a short-leash.



An MDD working on a short-leash.

3.2 PPE for MDD Handlers

Personal protective equipment must be worn by dog Handlers when undertaking all MDD operations in a SHA/CHA. In general, the body protection must match or exceed that used by manual deminers as detailed in Chapter 2 of these SOPs. MDD Handlers must have unobstructed voice control over their dogs, so goggles or short visors are preferred for eye protection.

3.3 Working-distance between MDD Sets

The minimum working-distance for working MDD Sets should not be less than the approved working-distances for manual demining at a task and may be extended when there is a need for MDD not to distract each other. Generally, MDD should work at least ten metres apart. In High Threat areas, the actual working-distance must be based on the MDD Coordinator's assessment of the working parameters.

In areas where there are obstructions on the ground, the MDD Team Leader and MDD Coordinator should plan an MDD approach that avoids distraction for the MDD.

3.4 Constraints according to the Task Assessment

When MDD are deployed in areas inside the SHA/CHA, all search systems must involve searching the same area with two MDD unless the area has been declared No Known Threat in the Task Assessment and undergrowth has been removed. When the ground in a No Known Threat area has been processed by a machine, the area may be searched by only one MDD. The decision over whether to make a single MDD search after mechanical ground preparation must be made by the MDD Coordinator on a case-by-case basis and should never compromise safety. The Handler must always be happy to walk over the ground searched by the dog.

The "L-shape" search approach can be used to cover wide areas with two MDD in Low Threat areas and in those areas where missing mines may have moved.

The "Base-line" search approach can be used to make breaches into areas using two MDD Sets.

The "Box" search approach may be used in any area. When used in High or Low Threat areas, two MDD should be used to search the box.

4. MDD Team structure

The minimum MDD assets for effective deployment are six dogs and three Handlers/trainers. These numbers should be increased according to need. One of the Handlers should be the MDD Team Leader. The MDD and Handlers must be managed by an MDD Coordinator and report to him/her on all MDD issues.

An MDD Team usually has the following staff:

- an MDD Coordinator;
- an MDD Team Leader (responsible for the control of all MDD Team members at a task);
- MDD Handler(s), each with two dogs;
- Kennel Assistants (suitably trained);
- Driver for MDD Transport;
- manual deminers (a sufficient number for the Task); and
- manual demining Section Leader (under the direction of the MDD Team Leader).

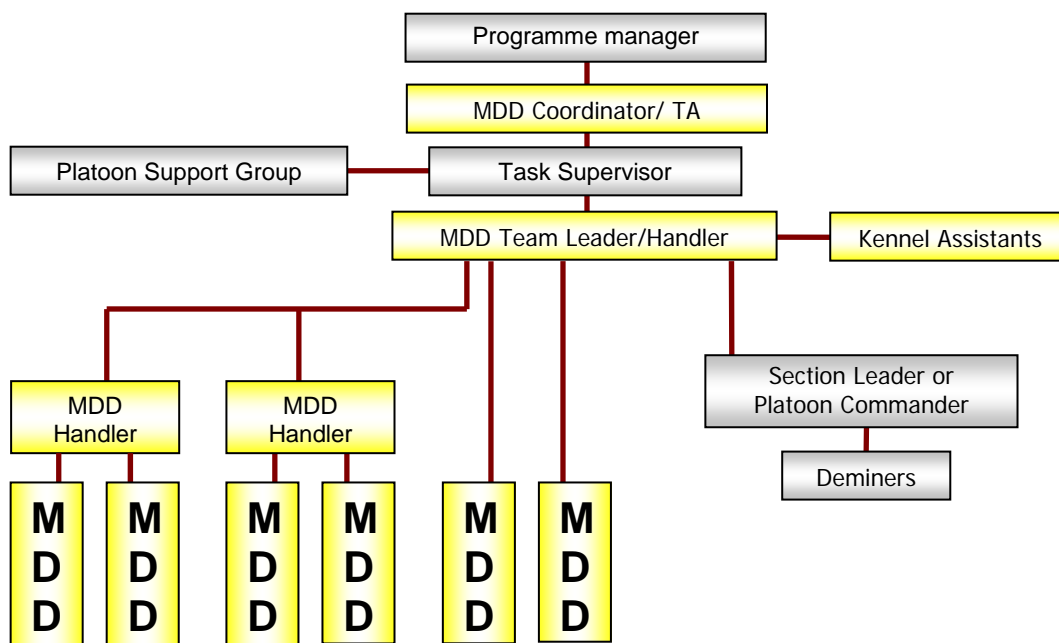
An MDD Team should include a sufficient number of manual deminers for the Task they must undertake. A single Section may be controlled by a manual demining Section Leader. If more than one Section is required, a Platoon Commander should control the Sections under the direction of

the MDD Team Leader. While MDD are operational, the manual demining assets should fall under the site control of the MDD Team Leader.

While working with an MDD Team, the manual Section(s) must follow the Manual Demining SOP with the exception of the MDD area marking and the MDD signal investigation.

The MDD assets may be split into two MDD Teams when required. Each MDD Team will have its own Team Leader (usually also an MDD Handler) who is responsible for the appropriate and safe deployment of the MDD and manual deminers.

The MDD Team is shown in the diagram below.



The team structure shown above may be adapted as the number of MDD Sets is increased or numbers of team members vary.

The Paramedic and ambulance should always be within five minutes of the area being searched before the MDD Team can be deployed. The Paramedic and ambulance should be shared with others working at a Task when this avoids duplication of medical cover.

5. Approved MDD search-patterns

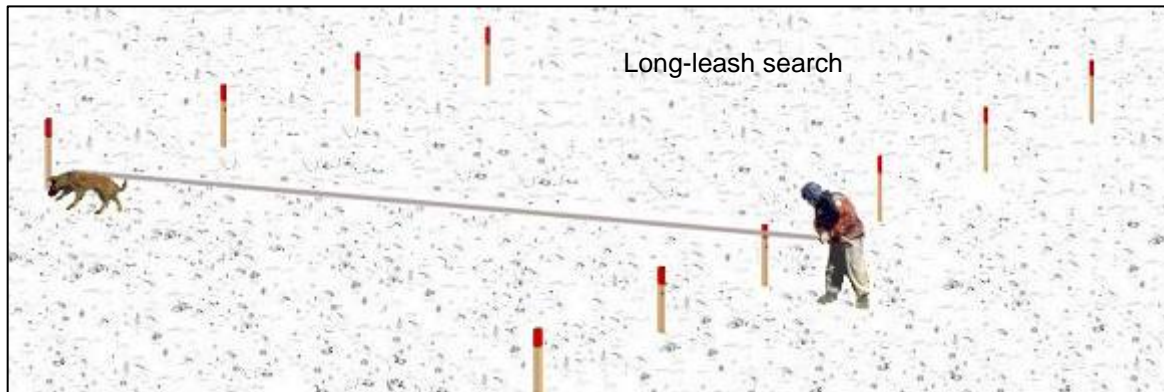
Search-Patterns used by the MDD Team are dictated by the length of the leash used by the Handler.

When searching Low Threat or No Known Threat areas using two MDD, the first Search-Pattern should always use a long-leash. A different MDD must be used for the second search, which can be conducted using either a short- or a long-leash. After two searches have been conducted without indications, the area is considered Cleared and the base-line moves forward to a metre less than the extent of the search (50cm in from each side and one metre in from the forward extent).

5.1 Long-leash

Long-leash MDD are trained to search from a base-line in a safe-area. Long-leash MDD search straight forward for ten metres from the base-line. On command they turn to the left while searching and search all the way back to the Handler. The Handler remains at the base-line and guides the MDD through the search using the leash and voice commands.

This search pattern may be used by a single MDD to make breaches into any area designated No Known Threat. This search pattern may be used to make breaches into any area inside the SHA/CHA, but must be repeated over the same area by a second MDD, usually on a short leash.



5.2 Short-leash

A short-leash MDD is trained to search on a short leash with the MDD Handler monitoring the MDD while walking closely at its side during the entire search. The MDD Handler walks on the side that the dog has already searched and guides the dog with the leash and by voice command.

When searching an area using two MDD, the second dog may be on a short-leash. The Handler during the second search must always walk on the side of the MDD that has been searched by two MDD.

To conduct a short-leash search, the Handler places a base-line tape/rope at the edge of the safe-area (the base-line) and takes the MDD to the left of the rope. All short-leash searches are conducted from left to right. On command, the MDD starts searching just beyond the base-line tape/rope with the Handler walking inside the rope. When the MDD reaches the right side, on command, it turns right into the safe-area. The Handler moves the base-line tape/rope forward 50cm (or less) and walks the MDD back to the left hand side without searching. On command, the MDD steps into the unsearched area and starts searching from left to right again. The Handler walks beside the MDD and on the searched side of the base-line tape/rope. In this way, the search progresses over the suspect area in 50cm “slices” with the MDD always searching while walking in the same direction. The Handler is always on the MDD’s right-hand side, walking on land that the MDD has searched.



6. MDD search approaches

The MDD will use one of three Search-Approaches. The appropriate Search-Approach will be decided by the MDD Team Leader in consultation with the MDD Coordinator. The four possible Search-Approaches are:

1. The “Box” -search approach
2. The “Long-Box” search approach
3. The “L-shape” search approach
4. The “Base-line” breach search approach

A search is conducted using the appropriate search-approach using one or two MDD using search-patterns that are appropriate for the ground and weather conditions.

6.1 The “Box”-search approach

The Box search approach is used when the area has been prepared by manual deminers or MDD making breach lanes to enclose areas extending 10 metres into the area to be searched with each box 10 metres wide. The boxing allows the MDD to enter the search area from any side, so can be used whatever way the wind is blowing. The Handler always steps on ground that has been previously Cleared. Search boxes can be extended as far as necessary into the area to be searched, but the preparation of the safe-lanes between the boxes can be very time consuming. The MDD Base-line breach search-approach should be used to help prepare boxes when possible.

The Box-search approach may be used anywhere inside the SHA/CHA. It may be preferred when some of the manual breaches have already been made during the Technical Survey and Clearance of any minebelts. The method may also be preferred when the manual deminers in the MDD Team would be idle if not preparing boxes.

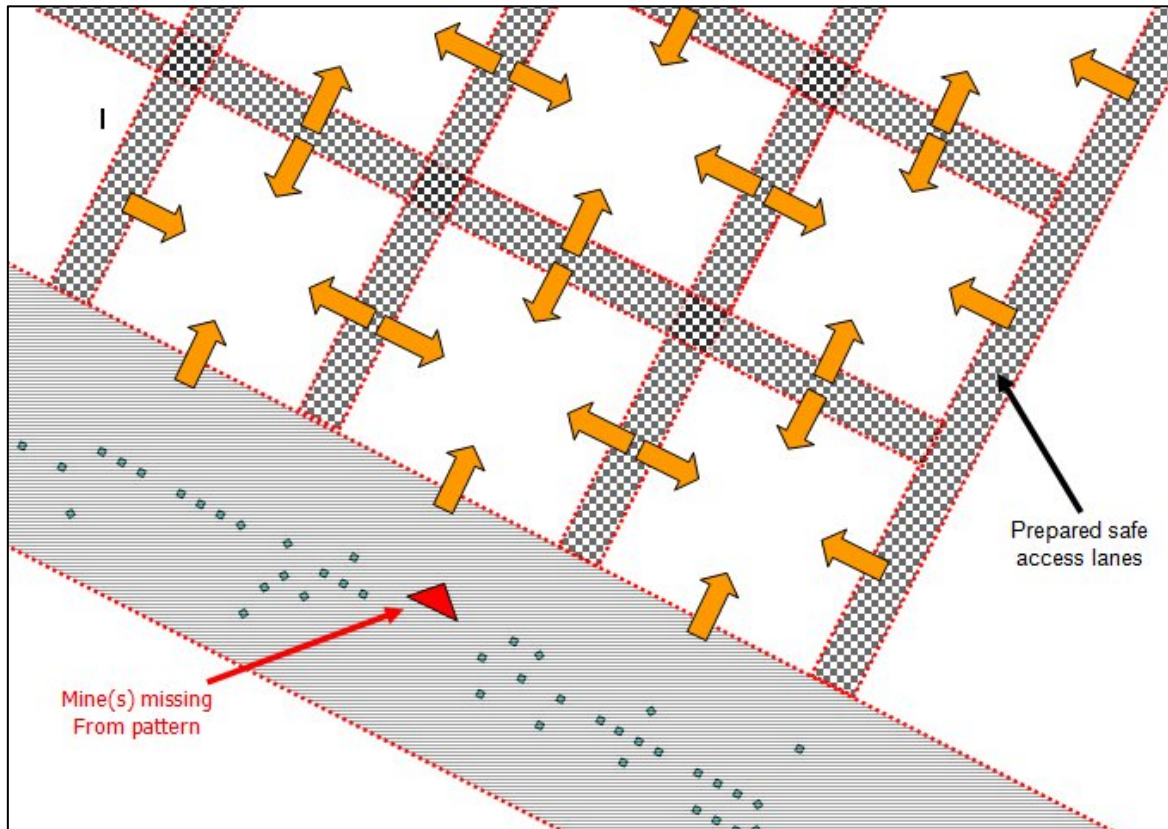
The Box-search approach allows access to the SHA/CHA from the four sides of the area. The box side-marking allows the Handler to read off the coordinates of an MDD indication, so allowing the indicated area to be easily located by the second MDD Handler and the follow-up deminers.

The Box-search approach can be used in internal QA of Cleared land without a second Clearance of the breaches. A single MDD may be used for internal QA.

The Box-search approach can also be used where large areas must be searched for missing mines that may have been disturbed by human intervention or natural events such as rainwater runoff.

Areas already Cleared using manual processes should be used as part of the box grid whenever possible, so reducing the manual preparation needed.

When mines are missing from a pattern, the MDD may be used to search for them in the area where they may have been moved. The areas to be searched will be determined by reference to the slope of the ground and any obstructions that may be present.



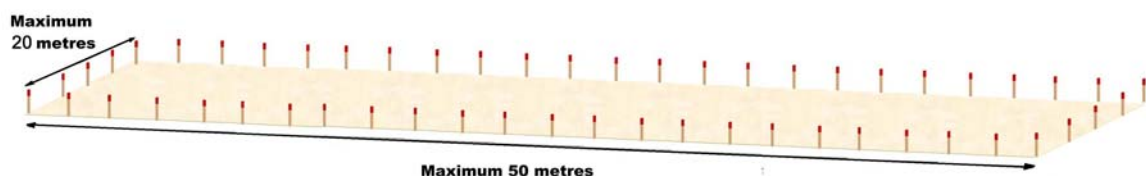
Drawing showing an area prepared for a Box-search and the possible search directions over that area

As with all MDD deployment, this search approach can only be used when there is no vegetation or other obstacles that can prevent the work of MDD (for example, strong smells, rubbish or salty ground).

6.2 The “Long-Box” search approach

The Long-Box search approach is used when the area has been prepared by manual deminers or MDD making breach lanes to enclose areas up to 50 metres long extending 10 metres into the area to be searched. The boxing allows the MDD to enter the search area from any side and allows the Handler to reference the MDD’s position against the marking opposite as long-leash search is conducted. Using a long-box requires less manual preparation than the ordinary square box approach. The MDD Base-line breach search-approach should be used to help prepare long boxes when possible.

The Long-Box search approach may be used anywhere in the SHA. It may be preferred when some of the manual breaches have already been prepared. The method may also be preferred when the manual deminers in the MDD Team would be idle if not preparing boxes.



Drawing showing an area prepared for a Long-Box search approach

The Long-Box search approach allows access to the SHA/CHA from the two long sides of the area with full visibility of the opposite marking. The marking allows the Handler to read off the

coordinates of an MDD indication, so allowing the indicated area to be easily located by the second MDD Handler and the follow-up deminers.

The Long-Box search approach can be used in internal QA and in tasks which involve searching large areas. It may be used where large areas must be searched for missing mines that may have been disturbed by human intervention or natural events such as rainwater runoff.

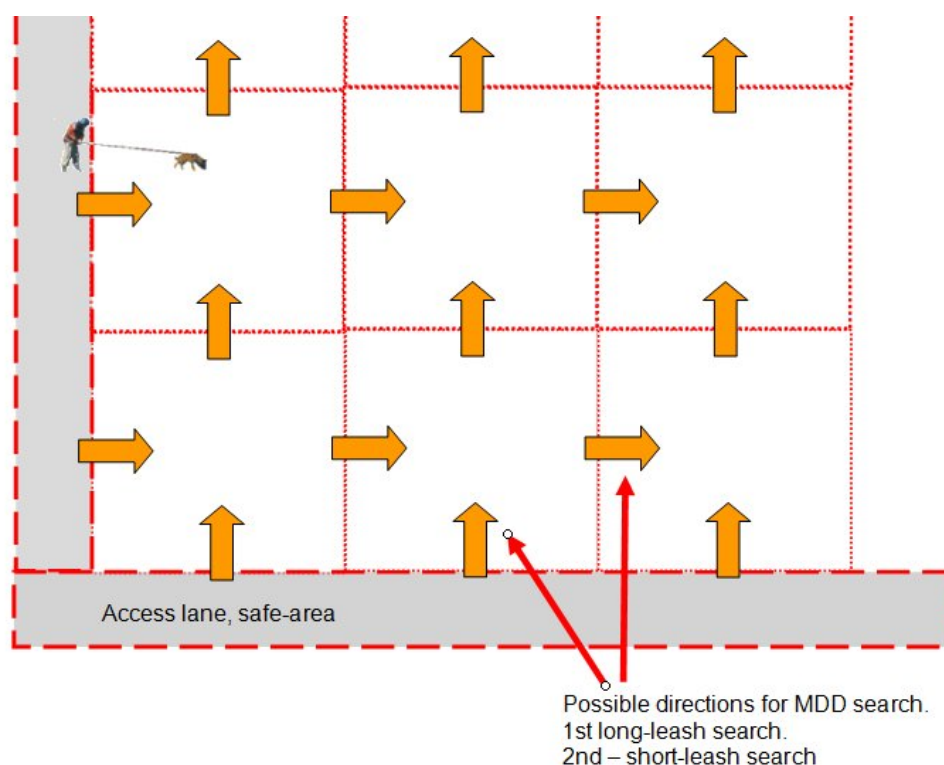
Areas already Cleared using manual processes should be used as part of the box whenever possible, so reduced the breaching needed.

As with all MDD deployment, this search approach can only be used when there is no vegetation or other obstacles that can prevent the work of MDD.

6.3 The “L-shape” search approach

The L-shape search approach uses less manual preparation than the **box** approach without reducing safety. The MDD can still work in varied wind directions and the Handler never steps on land that has not been searched manually or by MDD.

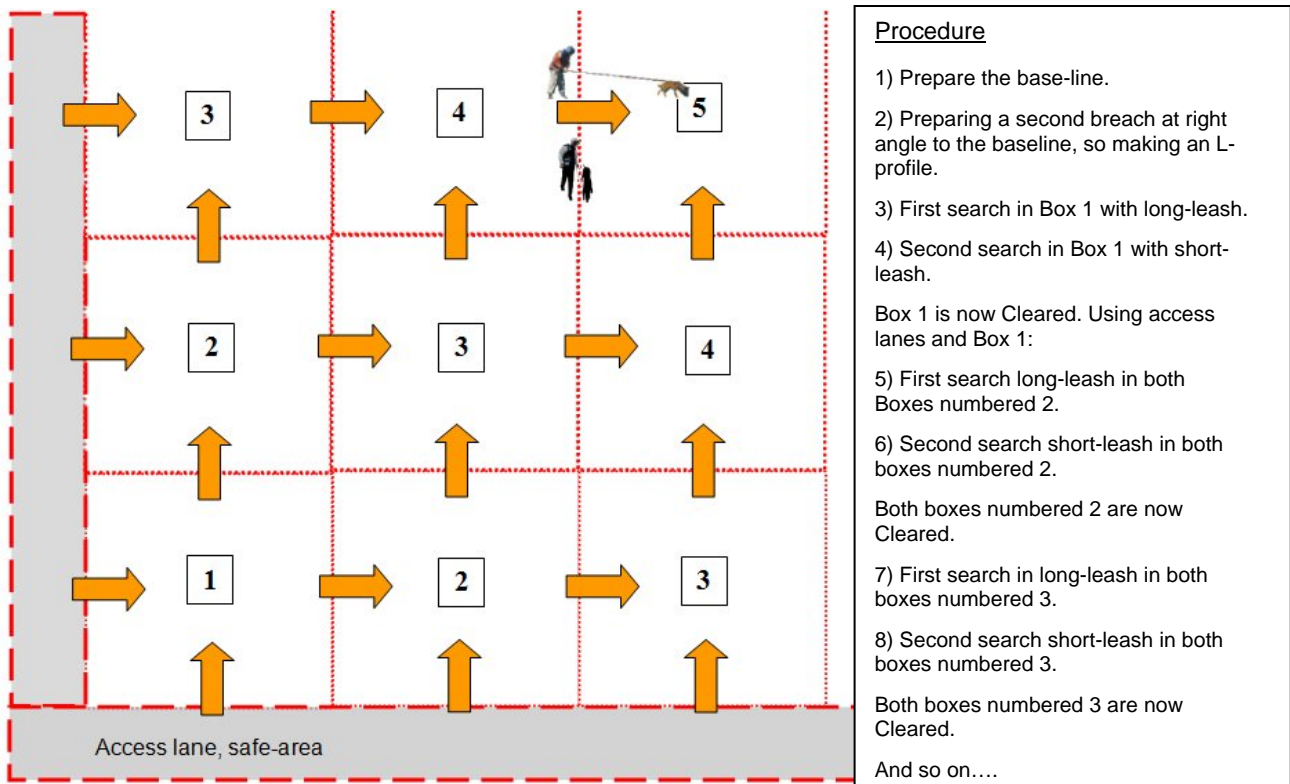
When the L-shape approach is used, safe lanes must be prepared that are at right-angles to each other, so making an L-shape. These can extend as far as necessary into the area to be searched.



Drawing showing a prepared L-shape area and the possible directions of search.

The L-shape search-approach allows access to unsearched land from two different directions. By choosing which dog will work across the wind, the MDD Handler is able to work in varied (but not all) wind directions. (If the wind speed is too high, the MDD cannot work at all, of course.) The L-shape approach still allows the Handler to mark an indication by placing markers on two sides of the “L”, so allowing the indicated area to be located during the second MDD search and by follow-up deminers.

The diagram below describes how each area is processed in 10 metre boxes but without cutting manual breaches between boxes. The procedure is described on the right of the diagram.



Drawing showing the L-Profile search approach

The area searched by the two MDD becomes the next safe-area on which the Handler can stand to control the MDD searching the adjacent area. In this manner, verification of extensive linear tasks can be conducted with the minimum number of safe lane breaches cut at right angles from a safe-lane.

The L-shape search-approach can be used in QA and in tasks which involve searching large areas. It is especially useful where large areas must be searched for missing mines that may have been disturbed by human intervention or natural events such as rainwater runoff.

Areas already Cleared using manual processes should be used as safe-lanes whenever possible, so reducing the manual Clearance needed.

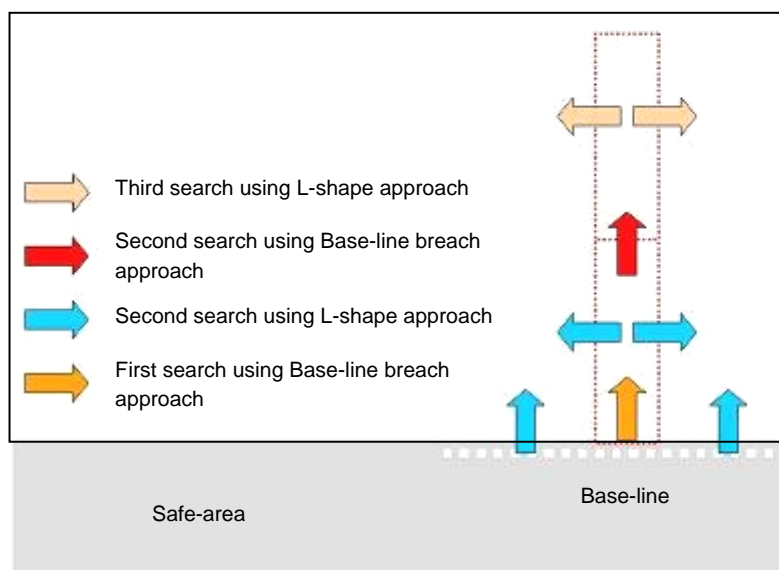
When mines are missing from the anticipated pattern, the MDD may be used to search for them in the area where they may have been moved. The areas to be searched will be determined by reference to the slope of the ground and any obstructions that may be present.

As with all MDD deployment, this search approach can only be used when there is no vegetation or other obstacles that can affect the work of MDD.

6.4 The “Base-line” breach search approach

The Base-line breach search approach can be used to reduce manual preparation for the Box or L-shape approaches without reducing safety. It can only be conducted when the wind direction permits, but should be used to prepare breach lanes whenever possible to maximise the efficient use of resources. The MDD Team-Leader and the MDD Coordinator must determine when the approach is appropriate to use.

When the Base-line search approach is used, either an existing safe-area is used for the base-line or a safe lane must be prepared on which the base-line will be marked.



Drawing showing a prepared Base-line search approach area and the direction(s) of search that may follow the first breach

The breach is three metres wide, but when side marking is placed after two MDD Sets have completed the search, the side marking is placed 50cm in from each side. This guarantees an overlap and leaves a breach two metres wide.

The breach is eleven metres long, but when end marking is placed after two MDD Sets have completed the search, the end marking is placed one metre back from the end to ensure overlap. The breach is then ten metres long and two metres wide.

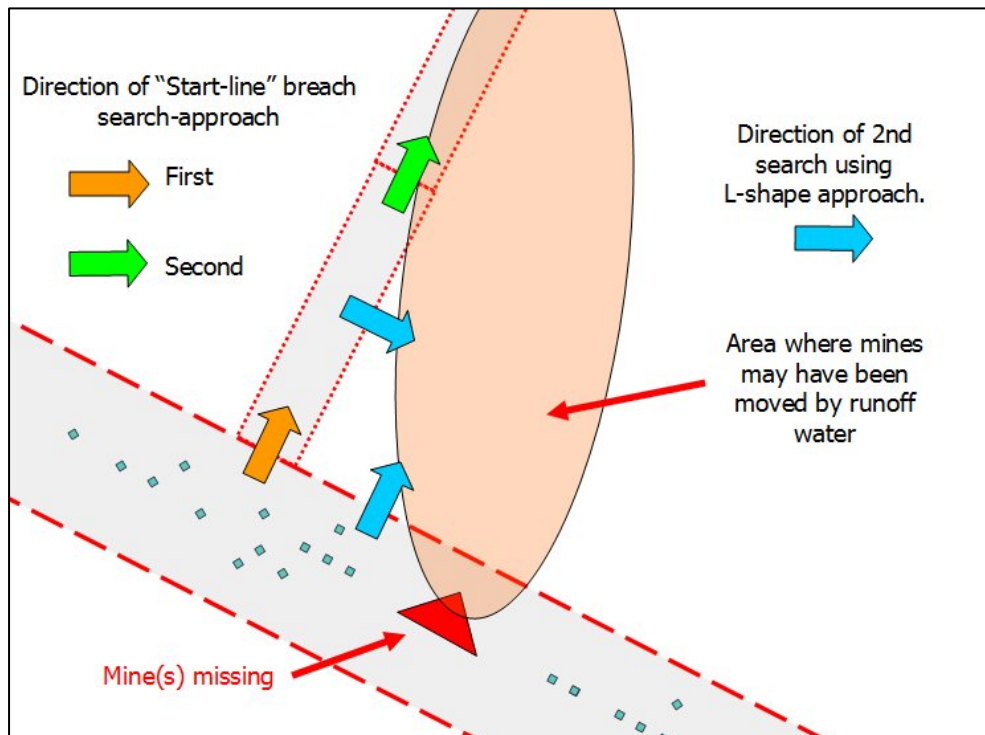
When an MDD indicates during a Base-line breach search-approach, the area leading up to the indication must be Cleared using manual procedures and marked afterwards.

The area searched by the MDD sets becomes the next safe-area on which the Handler can stand to control the MDD searching to extend the breach. In this manner, the MDD Team can make lengthy breaches into extensive linear tasks (such as during road Clearance).

The Base-line search approach can be used to search breaches that then describe an L-shape, allowing the L-shape search-approach to be used afterwards.

The Base-line search approach can also be used to make breaches into an area that other demining assets then use as a safe-lane.

When mines are missing from the anticipated pattern, the MDD may be used to search for them in the area where they may have been moved. The areas to be searched will be determined by reference to the slope of the ground and any obstructions that may be present.



Drawing showing an area prepared for making a breach using the Base-line breach search approach.

The main constraints on this search approach are the wind and terrain. As with all MDD deployment, this search approach can only be used when there is no vegetation or other obstacles that can prevent the work of MDD.

7. MDD target indications

A target indication is the response that an MDD makes when it has located a target. This is normally to sit down. When it is indicating, an MDD's attention must be directed towards the target and it must not scratch at the ground.

An MDD generally changes its behaviour and increases its interest before making an indication. The MDD Handler is trained to recognise changes in MDD behaviour as it searches. Any change of behaviour may be a sign of a positive indication so the Handler should, for safety reasons, withdraw an MDD that behaves in an unusual manner and then does not indicate a target. The MDD Team Leader should assess the MDD's need for refresher training.

- A **correct indication** is a positive detection of a target object or substance. This includes traces in the ground or on parts of a broken device.
- An **incorrect indication** is one where the MDD indicates an object or substance that is not within the group of target substances.
- A **false alarm** is when the MDD indicates a target without any reason being present.

NOTE: *When small bits of explosive have been spread in/over the ground by the passage of a ground processing machine, locating the small parts of explosive may be impossible. In these cases, a correct indication should be presumed.*

After the MDD has indicated a target, the Handler should call back the MDD which will turn to its left side and then return. Handlers should reward the MDD after it has returned to the safe-area. When the MDD has returned to the base-line, been rewarded and is again under close control, the

Handler's next actions will depend on the search-approach and whether the area is being searched using one or two MDD.

Two MDD are used to search the same 10 x 3 metre breach in the start-line search approach. If either dog indicates in the area, the MDD is withdrawn and the central 10 x 2 metre area must be searched by manual deminers.

In a one MDD search of a No Known Threat area, the Handler places a marker 50cm before the place where the MDD indicated. The Handler then notifies the MDD Team Leader who will assign manual demining assets to search the area indicated.

In a two MDD search of a High or Low Threat area, the Handler notes the position of the indication and the MDD continues its search. If the signal is so strong that the MDD is distracted from the continued search, the MDD should be withdrawn and the reduced area that has been searched noted. The second MDD should then be run over the area that was searched by the first MDD using a short-leash search pattern. The base-line tape/rope is moved forward as the search advances. Whether or not the second MDD indicates in approximately the same place, the Handler (who is always walking only on ground searched by two dogs) must place a marker 50cm back from the indication. The area searched by two MDD must be marked and the MDD Team Leader should assign manual demining assets to investigate the indication.

7.1 Marking an MDD indication

The purpose of marking an MDD indication is not to record the location of a target, but to record the *approximate* location of a target. The methods used may vary but must always indicate a position that is reached 50cm before reaching the place of indication. A red painted stone, red marking picket laid on the ground or a red plastic cone may be used. Lightweight markers should not be used when conditions are windy.

7.1.1 Marking during a long-leash search

The MDD leash that is used during a long-leash search pattern is 11m long and marked every 50cm. When the MDD indicates, the Handler will read the actual length of the leash and so know the distance from the base-line to the indication.

If the search uses the Base-Line breach approach, a second MDD is used to search the area leading up to the indication. After the second search, the Handler moves forward, always stepping on land that has been searched by two MDD, and places a marker 50cm before reaching the place of indication.

If the search area uses the L-shape approach, there should be marking placed at one metre intervals on the other side of the "L" from the side being used as a base-line. Handlers can very accurately project the position of the markers into the Cleared area and, combined with the leash length, gain co-ordinates giving the position of the indication.

If the search uses the Box approach, there will be marking placed at intervals on the opposite side of the Box. The Handler uses these to read the number of metres along the other side of the box and, combined with the leash length, can give co-ordinates for the indication.

NOTE: *When the area leading up to the indication has not been searched by two MDD, either another MDD search must be made over the area leading up to the indication, or a breach must be made using approved manual demining methods. Except in single MDD search of No Known Threat areas, no one should walk over the search area leading to an indication unless it has been checked by two dogs or Cleared using other assets.*

The MDD Team Leader should ask a manual deminer to investigate the indication. A deminer will approach the location of the MDD indication over land checked by two MDD and will Clear an area around the indication.

If the investigation shows the indication to be incorrect, the MDD search can begin again. Any indication inside the area that has been manually searched can be ignored as “clutter”.

7.1.2 Marking during a short-leash search

A short-leash search pattern should be used either when a single MDD is searching a No Known Threat area or for the second search over an area where a long-leash search has already been conducted.

Whichever search approach is used, when an MDD on a short-leash indicates in a No Known Threat area and the Handler is standing on ground that has not been searched by another dog, the Handler must place a marker 50cm closer to the base-line than the MDD indication and withdraw the MDD to the base-line. A second search using another MDD must be conducted over the area leading up to the indication. This may be achieved by using a short-leash or a long-leash search pattern.

When an MDD on a short-leash indicates during the second search of an area, the Handler must place a marker 50cm closer to the base-line than the MDD indication and withdraw the MDD to the base-line.

The MDD Team Leader should Task a manual deminer to investigate the indication. A deminer should approach the location of the MDD indication over land checked by two MDD and investigate the indication.

If the investigation shows the indication to be incorrect, the MDD search can begin again. Any indication inside the area that has been manually searched can be ignored as “clutter”.

8. Investigating an MDD indication

A manual deminer should search an area of two square metres around the indication. The deminer should approach the position marked by the MDD Handler(s) walking only on ground searched by two MDD. When two MDD have not searched the ground, the deminer must make a breach lane to the marker from a known safe-area unless the area is a No Known Threat area.

At the indication, the deminer should place a Hazardous Area picket/stone approximately 50cm before the marker placed by the Handler, then place two more Hazardous Area pickets/stones one metre to left and right of the central marker. These mark the start-line. The deminer should then follow the procedures given in Chapter 6, Part 3.2.2 in these SOPs.

When the MDD are following mechanical ground preparation and the MDD have found ten or more mine pieces at a Task and no intact devices, the MDD Coordinator may decide that manual Clearance of the two metre square box need not continue after a mine-piece has been found. The area must then be searched again using a second MDD.

8.1 Action after a mine/device is found

After a mine or ERW has been found, the MDD Team Leader should decide whether it should be removed by the EOD Operative or marked and removed later. This decision will be made with reference to the need to maximise MDD working time as long as safety is not compromised.

If there are three or more positive indications in a 10x10 metre search area, the MDD Team Leader must decide whether there is a risk of the signals becoming mixed and withdraw the MDD Set(s) from that area if it would compromise safety to continue. The perimeter of the area successfully searched by the MDD must be marked before the MDD Team leaves the area.

9. MDD Marking systems

In many cases, the MDD Team will arrive at a Task that already has some Clearance lanes and breaches prepared, and some marking in place.

To avoid site confusion the MDD Team will use the same marking as the manual deminers when possible. Existing Site marking, Control Point and other site requirements may be used as long as the MDD have a suitable rest area without disturbance. When the manual deminers assigned to the MDD Team needs to establish metal-detector test and calibration areas, etc, they must follow the Site Layout as detailed in Chapter 4 of these SOPs. The manual demining marking system is fully detailed in Chapter 5 of these SOPs. The MDD team also uses some MDD specific marking that must be removed when the MDD Team leave a Task.

9.1 Basic area marking for the MDD Team

Hazardous Area pickets/stones: Pickets with the top 10cm painted red are placed at one metre intervals to indicate the extent of the Cleared area perimeter (except where base-line tape/rope is used instead). When marking corners, a Hazardous Area picket/stone is placed to mark the corner, and two more are placed 30cm from the corner picket along the boundary between the safe-area and the hazardous area. Hazardous Area pickets may also used to mark the position of mines that are located during the MDD search before they are removed. After the device is removed they must be replaced by the appropriate picket showing what kind of device was found there.

Base-line tape/rope: This can be made of any suitable material, (such as cloth, plastic or nylon). The purpose of the base-line tape/rope is to mark the base-line between searched and un-searched areas when deploying MDD on a short-leash. The ends of the base-line tape/rope should be tied to two pickets or anchored by rocks at both ends of the start-line.

Base-line steel/wooden pickets: When used, these stand above the ground and are painted white. Base-line pickets hold the tape/rope that marks the position of the start-line from where the Handler sends the MDD when using a long-leash search. Painted stones may be used as alternatives to pickets.

Orientation pickets These are used to help the Handler to identify the position of an indication when he/she is using a long-leash and has two or more angles of approach to the area. Orientation pickets may be painted either red or blue. Painted stones may be used as alternatives to pickets. The pickets are placed in alternating colours at one metre intervals along the side of the area that the Handler is not using. When the opposite side is accessible, that is preferred, but when using the L-shape approach, the side of the “L” not being used as the start-line should be marked with orientation pickets. In all cases, Hazardous-Area marking pickets/stones may be used in place of pickets.

When used on the side opposite to the Handler, the orientation pickets also help the long-leash Handler to ensure that the MDD has covered all of the ground in straight lines

Start/end pickets: These are wooden or steel pickets used to mark the start and finish of work over an area when using a long-leash. Hazardous Area pickets should be used. They are placed in a “cross” to indicate the end of the search in an unfinished search area.

9.2 Operational marking during MDD tasks

Operational marking varies, but is always designed to ensure that there is never confusion between areas that have been searched and those that have not. When necessary, the MDD Team Leader should require more than the minimum marking to be used.

9.2.1 Minimum marking requirement

The minimum marking requirement is a base-line or start-line.

In Boxed areas, side making should extend around the box at one metre intervals before the MDD is deployed.

During L-shape and Base-line breach searches, when the Handler is confident that the area has been fully searched, the Handler instructs the manual deminers to place side and end markers (painted stones or Hazardous Area pickets) at two metre intervals around the sides of the area searched that are not already marked. To achieve overlap between adjacent search areas, the side and end markers should be positioned a minimum of 50cm in from the sides of the area searched and at least 50 cm back from the extent of the search. They should be placed a metre back from the extent of the search when it has been made by two MDD searching in the same direction. The MDD Handler must supervise the marking to ensure that there is no confusion about where marking is placed.

The MDD Handler is responsible for recording the area worked as required by the MDD Team Leader, who is directed in this by the Task Supervisor responsible for the Task.

9.2.2 Marking of Boxes

Boxes are marked with Hazardous Area pickets/stones or orientation pickets/stones placed every metre around the box to identify its borders. The Section Leader in charge of the boxing process is responsible for marking and giving an ID number to each prepared box before the MDD are used to search them.

When a Box has been searched by the MDD, the MDD Team Leader is responsible for ensuring that the ID number for the box is recorded as required by the MDD Team Leader, who is directed in this by the Task Supervisor.

9.2.3 Marking for long-leash search-patterns

Before deploying the MDD, the Handler must identify a base-line and when appropriate, place red and blue metal orientation pickets at one metre intervals within the safe-area on the side opposite, or at right-angles to the base-line.

The MDD Handler must then mark a starting position by placing two start/end markers at the base-line. The Handler should move the start/end markers between 50cm and one metre to the right along the base-line every time the MDD has finished searching and returned to the line. In this way the MDD Set progresses along the base-line.

Whenever a Handler leaves a search area uncompleted, the start/end markers should be moved 50cm back from the last searched lane (to ensure overlap when resuming the search), then placed in a cross on the ground.

When an unboxed area has been completely searched (using two MDDS when required), the Handler should ask the manual deminers to place side and end markers (painted stones or Hazardous Area pickets) at two metre intervals on the sides of the area searched that are not already marked. To achieve overlap between search areas, the side and end markers should be positioned a minimum of 50cm in from the sides of the area searched and 50cm back from the extent of the search. They should be placed one metre back from the extent of the search when it has been made by two MDD searching in the same direction. The MDD Handler must supervise the marking to ensure that there is no confusion about where marking is placed.

The MDD Handler is responsible for recording the approximate area worked as required by the MDD Team Leader, who is directed in this by the Task Supervisor responsible for the Task.

9.2.4 Operational marking for the short-leash search pattern

The MDD Handler should approach the base-line and select a starting position at one end of the base-line. The Handler must set up a base-line tape/rope across the base-line. The MDD will search on one side of the start-line tape in the unsearched area while the Handler monitors the MDD by walking on the other side of the start-line tape in the safe-area. When the MDD reaches the other end of the start-line, the Handler moves the base-line tape/rope forward 50cm (or less) and the process is repeated.

As the search progresses, the base-line tape/rope is moved forward toward the far end of the search area. When physical obstructions prevent the tape/rope being moved forward, the search should continue on only one side of the obstacle. The MDD Team Leader must decide how best to search the area around/over the obstacle.

If the Handler leaves a search area incomplete at the end of a shift, the start-line tape/rope indicates the base-line between the searched and unsearched area. When an area has been completely searched (using two MDDS when required), the Handler should ask the manual deminers to place side and end markers (painted stones or Hazardous Area pickets) at two metre intervals on the sides of the area searched that are not already marked. To achieve overlap between search areas, the side and end markers should be positioned a minimum of 50cm in from the sides of the area searched and 50 cm back from the extent of the search. They should be placed a metre back from the extent of the search when it has been made by two MDD searching in the same direction. The MDD Handler must supervise the marking to ensure that there is no confusion about where marking is placed.

The MDD Handler is responsible for recording the approximate area worked as required by the MDD Team Leader, who is directed in this by the Task Supervisor.

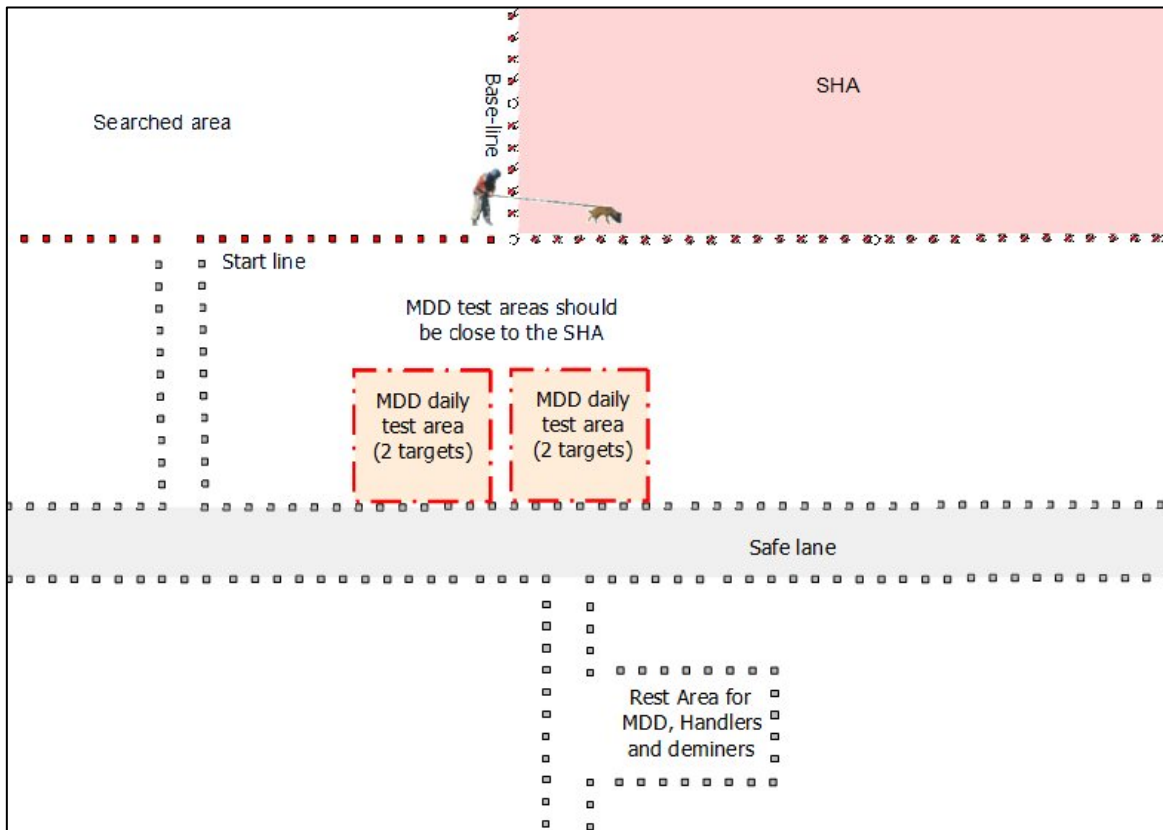
10. MDD site preparation and layout

The needs of the MDD Team vary from other assets and in some cases Task areas may need to be duplicated. For example, the MDD should not rest in any area that is close to a Mine/Fuze collection point.

10.1 General MDD requirements

The general requirements for site preparation and layout are given in Chapter 4 in these SOPs. The MDD site variations are described in Chapter 4, Part 3.4 of these SOPs.

Specific MDD requirements are shown in the drawing below.



An ambulance and Paramedic are not shown on the drawing above because they are shared with adjacent assets whenever possible. They should always be within five minutes of a working site before MDD Sets can be deployed.

MDD should be protected from direct sunlight during the day and rested in the shade whenever necessary.

When using metal-detectors, the site must have a detector calibration and test area close to the place where the deminers are working.

Car parking and other areas should be positioned in order to reduce unnecessary movement of personnel within the area. This can be very important to avoid disturbing the MDD, so a detailed plan of each site organisation should be made by the MDD coordinator liaising with the Task Supervisor.

10.2 MDD test areas

On-site MDD test areas must be used during the Daily Detection Capability Test by all operational MDD. The position of MDD test areas must be regularly changed. The position of targets concealed in the MDD test areas must also be regularly changed.

MDD Test areas must be positioned within or close to the Task area. The conditions inside the test boxes should be as close as possible to the conditions in the Task area. When inside the SHA/CHA, they should be in an area that has been searched and no mines or ERW found.

The test areas should be marked as described in Chapter 4, Part 3.4. All non-MDD personnel should avoid the area.

Target objects used for MDD testing may be small fragments of explosives, fragments of mines or ERW, or prepared MDD target mines as described in Chapter 10. Ideally, the MDD Test Areas will be established and the target objects placed before the MDD are deployed to the task. The MDD Coordinator must keep a detailed sketch that indicates the location of all target objects within the MDD test area. When a Task is extensive, several test areas should be established in different places at the site.

During the test, MDD Handlers should wear PPE and reproduce working conditions as accurately as possible.

The following constraints apply to the MDD test areas:

- No more than one target object can be located on the surface.
- The dog Handler must not know where the target objects are located.
- Target objects must be further than two metres away from each other.
- If the designated test area has been mechanically prepared, a minimum soak-time of seven days must be left before the area is used.

See also Part 11 in this Chapter.

10.3 MDD Transport

MDD must be transported in a safe and secure manner. The following conditions should be met:

- Handlers must ensure that sufficient water is available at all times;
- The transport cages used during travel must be safe and well ventilated;
- The MDD must be protected from wind and direct sun;
- If MDD are driven on dusty roads or in a convoy, the vehicles transporting MDD should travel at the head of the column. This is necessary to avoid their breathing dust pollution;
- During transport over long distances by vehicle, the MDD must be walked every two hours or more frequently; and
- MDD must be under constant supervision by Handlers or other MDD Team staff during transport.

Whenever MDD must make long trips by train, ship or air, the MDD should not be fed before departure.

11. MDD training, accreditation and testing

Dogs and Handlers need to be trained and retrained in order to maintain the high standards of disciplined work required. Each MDD Set must be internally accredited by passing tests before it is ready for deployment. External testing may also be required by the NMAA. When external accreditation to International Standards is conducted, the MDD Team(s) should do everything possible to facilitate the testing.

11.1 Internal MDD training and testing

Before they arrive, MDD are trained to make patterned searches on a long- or a short-leash and to keep their noses close to the ground, searching constantly. On command, they turn and return in a straight line, obeying voice and leash commands issued by their Handler. When they locate a

target, they are trained to sit. When an indication is positive, they are rewarded with either praise or play. This basic training is reinforced and extended with internal training in a continuous process designed to keep the dogs focussed and motivated.

11.1.1 Internal monthly test and evaluation

All MDD Sets should undergo a monthly internal test and evaluation. The MDD Coordinator is responsible for planning and conducting this test in which the MDD Set must successfully search of a minimum of 200 m².

All test results must be recorded. If an MDD Set does not pass, the MDD Set must be withdrawn from operational work and conduct appropriate retraining. After the retraining a new test must be carried out.

11.1.2 Daily detection capability test

A test of MDD detection ability must be carried out daily. At the discretion of the MDD Coordinator and MDD Team Leader, the daily test may be repeated at any time during a working day to ensure that the detection capacity and working standard of the MDD is appropriate.

MDD must search the test area using varied approaches while their behaviour, concentration, and the accuracy of their detections is assessed. Any MDD whose behaviour is erratic or which shows poor concentration must fail the test. Any MDD that misses a target must fail the test.

If an MDD fails the test, the MDD must be taken out of operational deployment. The area searched by the MDD during the last working day must be searched again by another MDD. The MDD that failed must be given intensive retraining and must pass another test before being redeployed.

11.1.3 Testing to reinstate Operational Status

MDD will automatically have their operational status revoked after annual leave, sick leave or any other disruption of work lasting more than 10 days.

In order for operational status to be reinstated, MDD teams must first spend at least three days in training, then pass the internal Monthly Test.

NOTE: *An MDD failing an internal test does not affect any accreditation issued by a third party.*

11.1.4 Internal accreditation of MDD Sets

An MDD Set is an MDD and its Handler. When the Handler has more than one MDD, the testing process must be completed with each MDD.

An MDD Set will only achieve operational status when the following conditions have been met:

- The Handler must have completed and passed the internal course for MDD Handlers;
- The Handler must be a trained deminer; and
- The MDD Set consisting of one dog and its Handler must have passed the internal certification test and an accreditation test conducted by the MDD Coordinator.

11.1.5 Internal certification test

In order to obtain operational status, MDD Sets must pass an internal certification test. The test parameters are:

- The MDD must conduct a total of 600 m² of successful searching conducted over a period of three days. The 600 m² comprises:

300 m² of searching in an area in which there are pieces of explosive and dispersed mines.

300 m² of searching in an area that contains five mines of at least two types.

- Target objects must have a minimum soak-time of one month.
- 100 m² of mine free area must be included in the test.

If the MDD indicates on all targets within one metre of the target, and if the overall search, intensity, focus and indication behaviour is satisfactory, the MDD Set will be issued an Internal Operational Status certificate and may undergo an accreditation test by the NMAA when required.

11.2 External accreditation of MDD Sets

When MDD Sets have qualified for internal certification, they may be required to apply for accreditation by the NMAA. Accreditation can be granted without a formal test if the National Authority is satisfied with the internal training. If an examination is required, the National Authority must arrange for the MDD Set(s) to be tested by a suitably qualified examiner within a reasonable timeframe.

When an external accreditation test is required, it must be conducted on a test site that is unknown to the MDDs and Handlers and where the conditions are as required in the MDD IMAS.

When the National Authority does not have appropriate testing areas or expertise, representatives of the National Authority may attend the internal Certification tests as observers (by arrangement).

11.3 MDD maintenance and development training

The successful deployment of MDD in mine action relies on intensive training, testing and the analysis of results. Attention to these factors, in addition to an emphasis on dog health, hygiene and nutrition, allows the MDD Coordinator to predict the capacity, ability and accuracy of MDD deployed in operational work.

Maintenance and development training are extremely important parts of the MDD programme. Continued training is critical to the maintenance of an MDD's detection capability.

The MDD Coordinator must implement an internal training program that is tailor-made for each MDD. This allows for the targeted correction of unwanted behaviour and the reinforcement of desirable behaviour. In this way the MDD Coordinator can ensure that each MDD performs to the highest possible standard when deployed for operational work.

11.3.1 Requirements of an MDD training area

The area selected for MDD training must be as similar as possible to the area where they will be deployed. The area should be similar with respect to topography, soil type, ground conditions, type and density of vegetation, pollution and waste.

The targets concealed in the training area must include a sample of the complete range of target objects and substances found in the mines and ERW expected in the area of operations.

The marking of the training area should be consistent with the marking used during operations.

It is very important to have absolutely accurate maps of all areas used for MDD training. These maps must record the correct position of targets, the types of target, and the date when each target was put in ground. The map must also record the names of the people who were responsible for preparing the area.

The training area should be maintained whenever necessary but at least once every second week.

Training activities are normally carried out for at least twelve hours a week while the MDD are operational. The MDD training can be carried out before and/or after work in the field each day or during normal working hours when the MDD Coordinator decides that it is necessary. Weekends can be used to ensure that the MDD are prepared for the coming week and so limit downtime.

Additional MDD training or testing is obligatory when:

- there is an extreme change of environmental or climate conditions in the area of operations;
- after any disruption or break of operational work of more than ten days; and
- if any MDD Set does not satisfy the daily detection capability test or an internal test.

MDD training should be carried out under supervision of the MDD Coordinator. The MDD training plan must detail the objective or problem that needs attention and how the training will achieve the required result.

A detailed internal record of each MDD's training must be kept by the relevant Team Leader. This record facilitates an understanding of the individual capabilities of various MDD Sets in varied conditions.

11.3.2 Physical stamina and Endurance Training of MDD

In order to maintain MDD physical readiness and the ability to work at maximum capacity, regular endurance/stamina training is necessary. This training should include long walks and may include swimming. When possible, swimming can be a particularly important part of endurance and strength training because it is not time consuming for Handlers and because the water cools the MDD's body temperature on hot days.

12. Internal MDD Team documentation

Reporting requirements at each Task site are managed by the Task Supervisor. The MDD Team Leader must provide progress and performance reports as described in Chapter 12.

In addition to Task reporting, the MDD Team Leader must ensure the maintenance of the MDD Team reports described below.

12.1 MDD Team daily report

The MDD Team keep a daily record of the MDD Team's activity whenever the MDD Team is deployed to an operational Task. The daily report must record:

1. Date (day/month/year);
2. Name and surname of the MDD Coordinator and MDD Team Leader;
3. Number of all persons present and deployed on the Task site (Handlers, deminers, and others);
4. Working hours;
5. Downtime;
6. Data on all searched areas (ID number, size, search team, type and number of all mines and UXO located etc., including GPS coordinates of turning points);
7. Sketch of the area searched including the positions of all devices found;
8. Additional remarks; and
9. Comments related to the Risk Assessment and/or Task Release Plan (especially any recommended changes as a result of information gained during the day's work.

12.2 Internal List of Operations

This is a record of all activities carried out at a specific Task. It is kept by the MDD Team Leader. Each MDD Handler keeps an Internal List of Operations and these are combined by the MDD Team Leader every working day.

The Internal List of Operations must record:

1. Team work schedule by area ID;
2. Time of entering/leaving Task site;
3. Weather conditions;
4. Findings; and
5. Other remarks and observations.

12.3 Daily Test Records

The MDD Team Leader must keep a record of the daily detection capability test that each MDD Set must complete before deployment.

The Daily Test Record records:

1. The names of the tested team;
2. The number of target objects located in each test area;
3. The number of missed target objects; and
4. Remarks and observations.

13. MDD CASEVAC and healthcare

General CASEVAC procedures are documented in Chapters 6 and 7 of these SOPs. Additional instructions that are relevant to the MDD Team are given here.

In case of an accident close to a deployed MDD, the Handler will remove the MDD from the area and guide it to the nearest safe-area. If the Handler is needed to assist with an evacuation, the MDD may be left unattended but must be secured.

13.1 Action when an MDD is injured

If an accident has caused injuries to both people and MDD, the medical treatment of the people must always have first priority.

When any injured staff are receiving help, the MDD Team leader and/or MDD Handlers may turn their attention to the MDD. If the MDD is inside a hazardous area, it must be approached using approved manual demining processes to ensure that the recovery team is not put at risk. MDD Handlers are trained deminers and may make a breach to the MDD when necessary.

If the MDD is seriously injured with wounds that are likely to be fatal or that will cause severe disability, the MDD should be destroyed without moving it from the accident site. If the MDD is in an uncleared area or in a Cleared area where it initiated a device, the area around the MDD must be manually Cleared and the corpse removed. If the MDD is injured in an area where there may be fragmentation mines or tripwires, a breach should be made and the corpse should be pulled into the safe-area from a safe distance before it is carried away for disposal.

If the MDD is not seriously injured, it should be encouraged to make its way back to the base-line and given appropriate first aid. After the MDD has received first aid, it should be transported to an appropriate veterinary institution.

If the MDD is seriously injured with wounds that are likely to be fatal or that will cause severe disability, the MDD must be destroyed as soon as possible.

Severe injuries include:

- High amputation of extremities (above elbow on a front extremity; above ankle on a back extremity);
- Injuries to the skull or head including cranium fractures;
- Injuries to the spinal cord;
- Injuries to the pneumothorax, caused by penetrating wounds through the body; and
- Injuries that, on the surface, cover more than 1/3 of the abdomen.

The MDD Coordinator or MDD Team Leader must decide whether the MDD should be destroyed with a view to minimising its pain and discomfort.

13.2 Procedures for medical transport of an MDD

In case an MDD requires emergency CASEVAC, the MDD Team staff should react as described below.

The MDD Handler should:

- identify wounds on the injured MDD's body and reports them to the MDD Team Leader and MDD Coordinator;
- monitor the MDD's behaviour, looking especially for signs of extraordinary stress, passivity or aggressiveness; and
- arrange for first aid to be administered or, when no more qualified person is available, provide emergency first aid to the MDD.

The MDD Team Leader should:

- provides first aid to an injured MDD;
- manage the emergency transport of the injured MDD;
- informs the MDD Coordinator;
- retain overall control of the rescue efforts unless/until more senior personnel arrive;
- ensure that the borders between searched and unsearched areas are marked so that staff attending the injured MDD remain safe at all times;
- conduct first aid on the injured MDD if he/she is not needed to assist with human casualties and if no more qualified MDD personnel are available to do so;
- review the MDD's injuries and decide whether immediate euthanasia is necessary; and
- ensure that a driver is on standby for the transport of the injured MDD.

13.3 MDD First Aid

During MDD operations and training, first aid kits must be available at all times. The first aid kit should be located in the vehicle used by the MDD Team Leader.

In case of an MDD injury, the Handler can give first aid to the dog but the MDD Team Leader is responsible for ensuring that all treatments are conducted correctly. In case of serious injury, the dog must be transported, as soon as possible, to a suitable veterinarian facility.

Application of serum or injections against snake bites may be carried out as required in the field.

The following must be treated by a veterinarian:

1. injuries involving fractures;
2. open wounds that are longer/deeper than 2 cm;
3. burns; and
4. infected wounds regardless of size.

13.4 MDD Health Care

The purpose of the MDD health care program is the prevention of disease. Health care starts in the kennel with hygienic living conditions and a dog food that provides the right balance of vitamins, minerals, protein and fat.

13.4.1 Annual Health Check by Veterinarian

In order to prevent disease and maintain good health among MDD, regular and periodical health checks are essential. Thorough health checks of MDD must be carried out by a veterinarian in adequate facilities at least once annually and should include:

- analysis of general physical condition;
- blood and urine analysis; and
- check of all organic conditions and their functions.

The MDD Coordinator is responsible for arranging the detailed health check with a qualified and properly equipped veterinarian.

13.4.2 Daily health Check by Handlers

Daily health checks involve inspection of the following:

- general physical condition of dog;
- temperature check;
- mouth and teeth;
- ears and eyes;
- hair and skin;
- urine and droppings;
- genitals and anal region;
- need for water; and
- appetite.

13.4.3 Yearly Vaccinations

Once a year, vaccination against the following diseases should be carried out:

- Rabies;
- Distemper;
- Parvovirus; and
- Leptospiroses.

Other vaccinations may be required at the discretion of the MDD Coordinator. De-worming and protection from external parasites should be carried out every three months or as necessary.

14. MDD working hours

The working times of the MDD will vary. The working hours in a day should be a minimum of eight hours and the MDD working week will normally be for five days. The eight working hours for MDD includes morning and afternoon training and exercise periods. MDD Handlers do not have the time off that other staff enjoy because animals need to be cared for seven days a week.

During operations, an MDD must have a minimum of five minutes break every 30 minutes. Handlers must pay attention to the MDD during work and take breaks when necessary to ensure productivity and quality.

Working hours and shifts should be very flexible and dependant on the weather and the season. MDDs need daily care and attention so the MDD Team usually works longer than the minimum hours required. Because ability with animals is essential, the appointment of all MDD Team personnel must be approved by the MDD Coordinator.