



Chapter 4

Survey Procedure

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1. Introduction

The survey is part of the area clearance of Silavan UXO Survey Clearance and Ordnance

Disposal Company Limited (SLV). The survey is to collect information on the area's condition and area boundaries as requested by the customer. The information obtained will be used in planning the clearance work to ensure the efficient and effective use of the company's clearance resources.

2. **Scope**

This Standard Operating Procedure covers the procedures and requirements for surveys for UXO clearance work conducted by Silavan Survey, Clearance and Ordnance Disposal Co., Ltd (SLV). The operation will only perform general surveys to collect data for site clearance and demolition work, but will not perform technical surveys.

3. **The survey team of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV)**

Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV) has personnel in the clearance teams who are trained and experienced in surveying.

When it is time to conduct a survey, the field operations supervisor will appoint and assign clearance operators in the clearance team to carry out tasks as required.

4. **Survey standards**

The survey standards for all clearance work of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV) are:

- a. Distance measurement: Must be measured on a flat surface and tolerances within +/- 0.3 meter.
- b. Directional measurement (angle): Measure forward and backward for verification and error. The error is between +/- 1 degree.
- c. Coordinate measurement (GPS): The map system used is WGS 84. The coordinates used are UTM/WPS.

4.1 **Report code system**

The attached document A also shows the task code system of Silavan UXO Survey, Clearance and Ordnance disposal Co., Ltd (SLV), including general survey tasks, survey for specific data collection tasks, area clearance tasks, and roving tasks.

The task code system is used in all reports of Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV).

4.2 **Survey for roving tasks**

The roving task is to destroy unexploded ordnance remains in public areas as reported by local communities.

Normally, Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV) will not perform mobile destruction tasks to destroy commonly found UXO, except in cases where the client requests the company to perform mobile destruction tasks within a certain scope. If there is

a need, the survey unit of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV) will conduct a survey to collect UXO data, mark locations, and draw the maps to provide supporting information for the roving units and facilitate later demolition operations.

4.2.1 Marking the location of UXO during survey

The decision to mark the location of UXO found during a survey is based on an assessment of the likelihood that the UXO will be disturbed or moved if marked. The risk assessment for this issue will follow the guidelines set out in Chapter 4 of the National Standards.

When marking UXO, the local community in the area is explained or informed about the location and meaning of the symbols used.

If there is UXO that the survey team has marked but the team of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV) is unable to destroy the UXO, complete the detailed information of the UXO and report it to the NRA Office, referring to Chapter 8 of the National Standards.

4.3 Survey for Area Clearance

4.3.1 Definition of clearance tasks of Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV).

The clearance of the Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV) is based on the proposal of the customer who determines it.

When the company receives a proposal from a client, the first step is to coordinate with the client to determine the exact extent of the area that needs to be cleared, which may require a physical survey.

4.3.2 Procedures for survey and clearance work of Silavan UXO Survey Clearance and Ordnance disposal Co., Ltd (SLV)

The survey process for the Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV) includes:

- a. General survey: Aims to collect basic information in the area to be cleared to inform planning and implementation of clearance tasks.
- b. Technical Survey: A survey to obtain specific information about an area to determine the extent, level of UXO contamination, and other technical information to provide for operations.
- c. Post-clearance survey: This is the final survey before handing over the land to the client to use the cleared land.

4.3.3 Planning of the survey work

Before conducting any survey, advance planning is required. The planning should cover the following details:

- a. Research geographical information about places to explore, such as:
 - (1) Relevant locations that facilitate the survey
 - (2) Location of districts and villages in the area
 - (3) Access road to
 - (4) Geographical location of the relevant area
- b. Research information on the impact of UXO in the area. Research information may include:
 - (1) Report on the socio-economic impact of explosive remnants of war in the Lao PDR in 1996.
 - (2) Accident information
 - (3) Bombing database
- c. Review data on previously performed clearance tasks
- d. Determining the resources (personnel, equipment, vehicles, time, etc.) required to conduct the survey.
- e. Ensure that preliminary work such as required grass/forest cutting is completed before conducting survey work.

4.3.4 General survey

Typically, a general survey is a general collection of information about the area in which the clearance will be carried out. The main objectives of a general survey are:

- 1^{4.3.4}. To confirm the impact of UXO in that area
- 2^{4.3.4}. To mark the boundaries of areas that need temporary clearance.

The general survey is about:

- a. Study the information obtained during planning (paragraph 4.3.3 above) to determine the presence of explosive remnants of war in the area.
- b. Visiting the area and talking to authorities and communities to collect information on the impacts of UXO. This information may include:
 - 1.^b Historical information about the battle in the area and especially in the area where the clearance will take place.
 - 2.^b Information about the clearance in that area in the past, who did the clearance and what year the clearance was carried out.
 - 3.^b Information on accidents involving people and livestock associated with the area to be cleared will be collected as this information may help to determine the type of UXO in the area.
- c. A physical survey of the area may involve local people and will look for evidence of UXO. This survey will determine current and past land use, and how long the land has been used for each activity.

- d. The marking of the entire land area to be cleared during this general survey is only a temporary marking, while permanent marking will be created upon completion of the clearance before handover to the client.
- e. Identifying factors that affect the clearance such as high mineral soil, termite mounds, ponds, large rocks, forests, etc. This information will help in planning the work. In addition to the above information, the general survey should include the following information:
 - 1.^e Area details such as province, district, sub-district and villages involved.
 - 2.^e Name, details of the person who is the customer coordinator.
 - 3.^e Information on UXO includes the type, quantity, and location in the clearance area.
 - 4.^e General information about the area that may be used to support future UXO clearance. This information includes:
 - 1. Access road to the site
 - 2. Accommodation/living space
 - 3. Electricity
 - 4. Fuel, food and drinking water
 - 5. Local hospitals and hospital standards
 - 5.^e Is there a cell phone signal or other form of communication? These factors must be determined for each site. If there is no cell phone signal or high-frequency radio waves in the area to be cleared, details must be recorded and the nearest cell phone signal or high-frequency radio waves must be recorded.

Data from the general survey is reported in the “General Survey Report”. A copy of this report is available in Standard Operations Procedure 10 on Reports “Reports”.

The General Survey Report is an internal report of Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd (SLV) that provides information to the company's field managers.

4.3.5 Marking the boundaries of the area to be cleared when carrying out general survey operations

When the company's survey team conducts a general survey in an area at the request of the client, the survey team may need to mark the boundaries of the area that needs to be cleared temporarily in advance, measuring the angles and distances between each precise point, as well as taking the coordinates from the GPS and recording them in detail.

The Starting Point should be marked in a prominent and permanent location, easily visible and close to the field, with a number and coordinates. The Starting Point will be a Reference Point to other points within the area to be cleared.

During the survey, landowners must be advised of the location and meaning of the markers used during the survey. They are advised not to disturb or remove the markers.

Marking the Field during a general survey, it is forbidden to dig or drive markers into the ground unless the area has been checked with a metal detector. When inspecting the location of the marker, if there is a loud noise, move it a little further to a quieter area.

4.3.6 Survey to collect specific information

A specific survey is usually only required when a general survey has clearly identified a need for clearance. The purpose of a specific survey is to collect specific information about the area to be cleared to assist in planning. The specific survey of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd (SLV) will include the following activities:

- a. Visual inspection to look for evidence of remaining UXO.
- b. Technical surveys were conducted to sample the area of the site to be cleared. This sample was to make the size of the site clearly visible if the area contained unexploded ordnance or not.
- c. Type of clearance: To determine the type of clearance during a technical survey, the criteria must be the same as the intended use of the land, such as: the standard clearance of areas for use as farmland and areas using large loop detector for deep search, that areas are to be used for fish ponds, etc.
- d. When encountering problems with bomblets dropped from aircraft or large munitions, and the use of the area requires the use of heavy machinery, deep search equipment can be used during the survey to clear the area.

During the technical survey, all signals read by the detector are to be excavated. The excavation should follow the detector signals to confirm that there are no explosives or hazardous explosive fragments remaining and to the depth required. The technical survey described above requires similar support to the team performing the UXO clearance operations.

4.3.7. Reduction of area clearance.

The company's UXO clearance operations do not have a policy to reduce the area to be cleared because there is a possibility that there may be UXO still buried in the ground or in the areas that have been removed.

4.4. Finding mines during survey operations.

If a mine is encountered during a survey, the survey team leader must assess the situation and confirm whether it is an accidental mine or part of a minefield. If a minefield is suspected, the survey must be stopped and reported to the field manager or the responsible Level 4 explosive ordnance disposal technician.

The field manager or Level 4 explosive ordnance disposal technician in charge must assess the situation as a single mine or a minefield. If a minefield is confirmed, the client must be informed and advised to fence the area in accordance with Chapter 4 of the National Standard.

4.5. Explosive ordnance disposal.

UXO found in areas to be cleared during the survey by Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd. (SLV) must record the details of the UXO and record the coordinates in the report. Whether or not to mark UXO found in areas to be cleared is based on the assessment as specified in Sections 5.1 and 5.2 of Standard Operating Procedure 2 “Marking”. All UXO found by the survey team will be destroyed when the Silavan UXO Survey

Clearance and Ordnance Disposal Co., Ltd. (SLV) clearance team begins the operations in the area.

4.6. Survey after completion of clearance and handover-receive back of the site

All tasks of Silavan UXO Survey, Clearance and Ordnance Disposal Company Limited (SLV), after the clearance is completed, a re-survey must be conducted to verify the accuracy of the data.

The post-clearance survey is conducted by the clearance team leader who is supervising the work and must be done immediately.

After the clearance is completed, the clearance team leader of Silavan UXO Survey, Clearance and Ordnance Disposal Company Limited (SLV) must perform the following:

1^{4.6} Demarcation of areas where use is permitted

After the completion of clearance and prior to site handover, all turning points that divide the site boundaries shall be permanently marked. The details of the marking method shall be as specified in Clause 11 of Standard Operating Procedure 2 on “[Marking System](#)”.

2^{4.6} "Survey report after the completion of clearance"

The post-clearance survey must clearly inspect the actual site area and record the location of those points. When conducting a post-clearance survey, the following steps must be taken:

- a. Recheck the coordinates of Bench marks, starting points (SPs) and turning points (TPs).
- b. Recheck the angles and distances between the points.
- c. Determine the location of the UXO in the field by either measuring the angles and distances from the turning point to the UXO or recording them with coordinates.

3^{4.6} Survey report after the completion of clearance.

The results of the post-clearance survey are recorded in the “Post-Clearance Survey Report”, a copy of which is available in Standard Operating Procedure 10 on “Reports”.

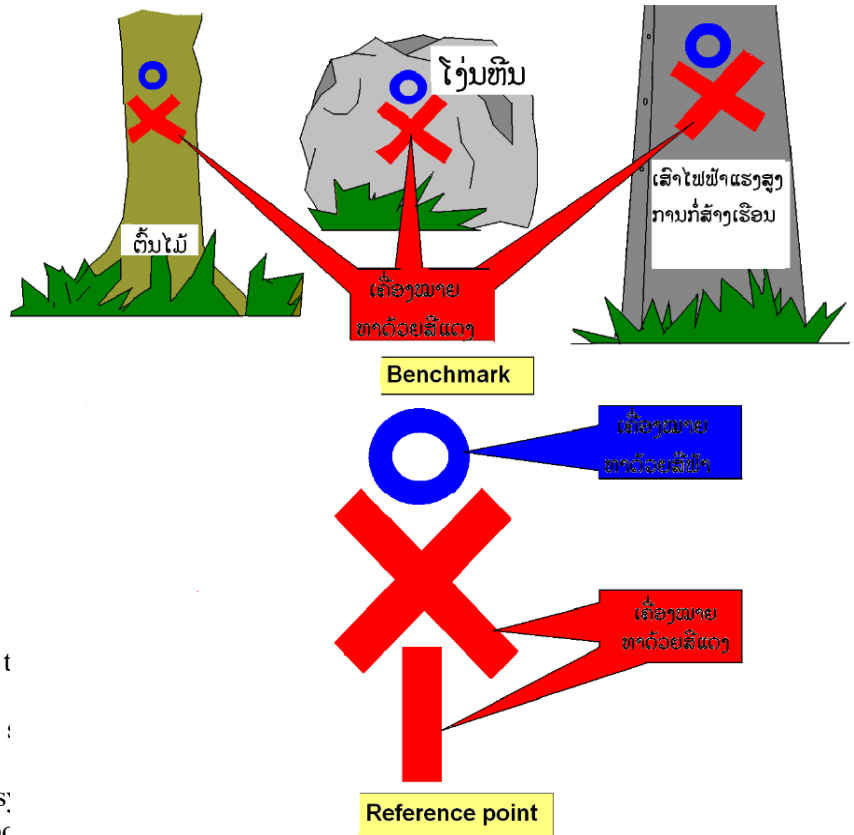
Once the information is complete, it must be submitted to the field manager of Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd. (SLV) for review before further distribution.

4.7 Attached document

1.^{4.7} Appendix A

Reference points standards of Silavan UXO Survey Clearance and Ordnance Disposal Company Limited (SLV)

Starting sign.



Symbol Guidelines

Standard UXO Markers

1. Place the symbol on both sides of the reference point
2. When marking the tree, attach the symbol to the tree before painting
3. Always place the reference point symbols to avoid weeds covering the symbol

2.4.7 Appendix B

Symbols used in drawing maps of
Silavan UXO Survey Clearance and Ordnance Disposal Company Limited (SLV)

Starting Symbols for maps.

	ເຮືອນ		ຮົ່ວ
	ເຮືອນທີ່ສ້າງບໍ່ທັນ ແລ້ວ ຫຼື ເປັນ		ຕົ້ນໄມ້
	ໂຮງຮຽນ		ຖືກຕັດ
	ຖະໜົນໃຫ່ຍ		ແມ່ນ້ຳ
	ທາງຍ່າງ		ໜອງ/ສະ
	ທາງນ້ອຍ		ຕົ້ນໄມ້ທີ່ຕັດແລ້ວ
	ຂົວ		ຕໍ່ໄມ້
	ນ້ຳສ້າງ		ທໍ່ນ້ຳ
	ທົ່ງນາ		ທິດເໜືອ
	ຫຼັກປັກໝາຍເຂດແດນ		ປ່າໄມ້/ຟຸ່ມໄມ້

ລະເບີດກະປາງ	
	ຊະນິດບົມບີ
	ປະລິມານ
	ບ່ອນທີ່ບົມບີຢູ່
ອື່ນໆ	
	ບົມໃຫ່ຍ
	ລູກບົນຄົກ/
	ລູກກ້ອງ/ບັນຈຸຫຍ້າງ
	ລູກບົນໃຫ່ຍ/
	ລູກກ້ອງ/ບັນຈຸຫຍ້າງ
	ລູກມົນ ຕໍ່ຕ້ານຄົນ
	ລູກມົນ ຕໍ່ຕ້ານລົດຖັງ
	ລະເບີດມື/ປາຍບົນ
	ລູກຈະຫຼວດ

Note:

1. The examples shown above are basic symbols. If new symbols created by the company are added to the map, the symbols and their meanings must be written on the map.