NEW SOUTH WALES
POLICE SERVICE

PHYSICAL EVIDENCE SECTION

PROCEDURES MANUAL

Physical Evidence Section

Procedures Manual

PHYSICAL EVIDENCE SECTION

PROCEDURES MANUAL

Overview

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Procedures Manual

Amendments

Issue date	Revised by: Name Signature	Inspected by: Name Signature Date

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1.0 Purpose of the Manual

The Commissioner's Instructions provide rules which govern the administration and operational aspects of police officers. Though the Instructions apply to members of the Physical Evidence Section they do not encompass the technical duties of physical evidence officers. This Procedures Manual outlines the minimum operating standard for physical evidence examinations performed by the Physical Evidence Section.

The intent of this Manual is not to provide a static set of rules but to promote innovation and improvement in these important technical support services. Assessment and review of the procedures involved in performing these duties is vital to ensure services are of a professional standard and meet the needs of our clients. Thus the Manual will be revised and amendments distributed to reflect changing circumstances and needs.

This Manual will continue to include input from:

- client groups,
- personnel attached to the Physical Evidence Section,
- external agencies involved in the processing of physical evidence,
- information or research sources involved in physical evidence services.

Objectives

The objectives of this Manual are to:

- provide clear guidelines for operations,
- establish consistent, identified and recognised standards for a professional service,
- provide up to date, relevant procedures which keep abreast with technological change, legal requirements and responsibilities.

2.0 Structure of the Manual

The Procedures Manual is structured:

Crime Scene Units

Specialist Units

Crime Scene Units contains procedures common to all crime or incident scene examinations, specific procedures for various types of investigations, technical examinations, and requirements of external experts and laboratories. The volume then specifies procedures for disasters and facial identification followed by procedures for case management, human resource, equipment and work accommodation.

Specialist Units contains additional procedures which are performed by these Units of the Physical Evidence Section

3.0 Nature of physical evidence

Physical evidence maybe in any form: solid, liquid, or gas. It maybe large or microscopic. It is real and tangible.

In criminal matters, sources of physical evidence are found primarily:

- on the suspect (including their home, car, workplace, etc),
- on the victim, and
- at the crime (or incident) scene.

When interpreted physical evidence may:

- establish that a crime has been committed or an incident has occurred,
- establish, or assist in establishing, how the crime was committed or the incident occurred,
- identify or exonerate a suspect/s,
- corroborate or contest other evidence relating to the crime or incident,

In non-criminal matters physical evidence can assist in

determining causes for accidents, deaths, non-suspicious fires and other incidents.

The most important factor effecting the interpretation of physical evidence is the ability to find it and for it to be preserved in the condition it was at the time of the crime or incident. Circular 91/103 (appended to the Section on *General investigations*) sets out procedures to facilitate the location and preservation of physical evidence.

4.0 Physical Evidence Section

Role

The role of the Physical Evidence Section is:

"the provision of specified technical support services for all Police throughout New South Wales in regards to criminal, coronial and incident investigations".

This is to be achieved by:

- *examining, assessing, recording and collecting physical evidence from scenes and items,*
- *facilitating the examination of scenes and items by qualified experts,*
- *providing a range of advanced scene related technical support services,*
- *presentation and interpretation of findings for Judicial enquires and Courts,*
- *researching, monitoring, developing and introducing appropriate technology and procedures,*
- *liaising with investigating police so that physical evidence will be utilised to it's full potential,*
- *acting as an intermediary for investigating police and external laboratories and experts.*

All of the above duties performed under the strictest codes of professionalism and impartiality consistent with the statement of values.

Additional services provided by the Physical Evidence Section

include:

- Disaster Victim Identification,
- Improvised Explosive Device response,
- Facial Identification.

Structure

The Physical Evidence Section incorporates a number of separate units, including the 28 decentralised:

- Crime Scene Units,

and the State scarce resource units:

- Forensic Ballistics Unit,
- Document Examination Unit,
- Photogrammetry Unit,
- Vehicle Examination Unit (includes Vehicle Identification Team),
- Video Operations Unit,
- Clinical Forensic Medicine Unit.
- Crime Support Unit (includes Photographic Services Team),
- Mapping Unit,
- Police Armoury.

5.0 Fingerprint Section

The Fingerprint Section is a separate command. However, it is recognised and acknowledged that the Physical Evidence and Fingerprint Sections must work in close co-operation to coordinate and process evidence at the scene and discuss the results of examinations.

Where Crime Scene Examiners also perform fingerprint duties the Examiner is referred to the Fingerprint Section's Procedures Manual.

6.0 Training and research

Training is a shared responsibility of all members of the Section. The Officer, Units, Zones and the Training and Research Unit are involved in ensuring members reach and maintain professional standards in their work.

The Training and Research Unit provides and coordinates specialist training for Physical Evidence personnel. Training programs are designed to develop specialist training and facilitate general police and supervisory training for all members. Training begins with an induction package designed for Assist Officers (general duties officers on loan to the Crime Scene Units) and recruits to the Section through to tertiary level training. The later is provided through the joint development and delivery of the Associate Diploma in Forensic Investigation with the ACT Institute of TAFE. Supplementary training sessions, practical workshops and seminars provided or organised by the Unit ensure professional development of all members of the Section.

Training programs are generally designed as distance learning packages to provide uniformity of training standards and involvement of local expertise and supervision.

The Section is also committed to researching new procedures and techniques of physical evidence examinations. Research results from testing involved in case work and from structured research proposals. Research ensures that the Section provides clients with the highest quality services.

7.0 Occupational health, safety and welfare

Health, safety and welfare is the responsibility of all members of this section. Throughout the Manual occupational health, safety and welfare issues have been addressed. This is extremely important as physical evidence duties may involve working under unusual, hazardous and unpredictable conditions.

The safety procedures outlined comply with the Police Service's Occupational Health and Safety policies specified in Commissioner's Instruction 12.

8.0 Ethical considerations

Anti Corruption Plan

Crime Scene Examiners should be aware of the principles set out in the 'Statement of Values' and in the Physical Evidence Section Anti-Corruption Plan and, at all times, perform their duties within those guidelines.

The objective of the Physical Evidence Section's Anti Corruption Plan is to identify areas within the Section where corrupt practices could occur. Identification then enables the formulation and implementation of preventative strategies to attain and maintain the Section's credibility at the highest ethical and moral level.

It is imperative that the examination of crime scenes and of items of physical evidence is conducted honestly, accurately and impartially. The physical evidence officer should not be influenced by the views or recommendations of investigating police or other interested parties.

Allegations of corrupt activity can arise even though the physical evidence officer has not consciously acted dishonestly. If, for example the officer, through poor work practices, can be shown to have acted in a biased manner, the results of that examination will be tainted as may the credibility of the individual, the Section and the Police Service.

Crime scene examiners are required to be aware of the contents of the Physical Evidence Section's Procedures Manual and to conduct their examinations in accordance with the guidelines set out within the Manual.

9.0 Quality assurance

Quality control is maintained and improved through:

- effective managment and supervision
- adopting standard procedures
- identifying and meeting client needs
- providing effective training programs
- monitoring and evaluating work performance

The Procedures Manual, Commissioner's Instructions legislative changes and new techolgy provides the basis for quality

assurance management of the Physical Evidence Section.

CRIME SCENE UNITS

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Command and responsibilities

1.0 Type of service

The role of the Crime Scene Units is to provide physical evidence support services to all Police throughout New South Wales regarding criminal, coronial and incident investigations.

This is to be achieved by professionally and impartially:

- examining, assessing, recording and collecting physical evidence from scenes and items,
- facilitating the examination of scenes and items by qualified experts, including specialist services within the Physical Evidence Section, Institute of Forensic Medicine, Division of Analytical Laboratories and other physical evidence experts,
- providing the link between these experts and the investigating officers,
- coordinating and liaising with the Fingerprint Section regarding the examination of serious crime and incident scenes and items,
- providing a range of advanced forensic support services including specified technical examinations,
- providing Disaster Victim Identification services,
- providing Facial Identification services,
- presenting the findings to judicial inquiries and courts.

2.0 Availability of services

Crime scene examination services are provided on a 24 hour basis. Standard office hours are Monday to Friday day shift when the office should be staffed (except public holidays). After office hours the service is to be provided on a Call Out basis (under the arrangements specified in Circular 91/103).

3.0 Location of offices

There are 28 decentralised Crime Scene Units across the State. Each Unit is responsible for providing crime scene examination support services to a specified number of Patrols.

Units are grouped under twelve Zones.

A list of the Units with their normal operational areas plus the Zones are specified in Circular 91/103 (Appendix 1) and Sydney metropolitan and country maps (Appendix 2).

4.0 Organisation structure

Units are managed by a Leader. Zones are managed by a Zone Supervisor who is also the Leader of one of the Crime Scene Units within that Zone.

Responsibility for the Zone is divided between the Region Crime Squad (operational responsibility) and the Physical Evidence Section (professional responsibility). This is specified in Circular 91/103.

5.0 Officer responsibility

The Statements of Duties and Accountabilities should be referred to for each position. In addition, this Procedures Manual specifies responsibilities for staff. The following list of responsibilities generally defines the individual roles.

Crime Scene Examiner

The Crime Scene Examiner is responsible for providing high quality physical evidence services to, or beyond, the standard specified in this Procedures Manual. To achieve this standard the Examiner must become conversant with the contents of the Manual and perform this role in a courteous, helpful manner.

If the Examiner feels that a task is beyond their knowledge, skills or experience then they are obliged to seek advice or assistance from a more experienced Examiner, Unit Leader or Zone Supervisor.

Unit Leader

The Leader of the Crime Scene Unit has responsibility for the quality of crime scene examination services within their area.

To achieve this goal the Leader's role includes:

- performing the role of a Crime Scene Examiner,
- encouraging Assist Officers by talking with Uniform Officers, Patrol and District Commanders within the area,
- training Officers within the Unit (including Assist Officers) on a local basis,
- supervising Officers within the Unit,
- informing and ensuring other Police are aware of, and abide by, the contents of Circular 91/103 regarding scene preservation, responsibility for notifying and liaison with experts (including laboratories) and exhibit photography,
- identifying and resolving any problems with scene preservation,
- informing local Police and general public on the role of the Crime Scene Unit,
- informing local Police and emergency services officers of the Section's role and responsibilities in Disaster Victim Identification and participating in local disaster exercises,

Zone Supervisor

The Zone Supervisor has responsibility for the quality of crime scene examination services within their Zone. To achieve this goal the Leader's role includes:

- performing the role of a Unit Leader,
- overall management of the Zone,
- operation of the case management system within the Zone and providing this information to Physical Evidence command,
- ensuring uniformity of operational standards within the Zone in accordance with Section policy and procedures,
- determining work levels and prioritising work commitments according to local and Region requirements,
- ensuring Examiners have the skills and abilities to perform tasks,

- implement and monitor effective scene management practices throughout the Zone,
- implement and coordinate effective Disaster Victim Identification and Improvised Explosive Device procedures and practices within the Zone,
- conduct and coordinate training of Examiners within the Zone in association with the Training and Research Unit,
- financial management of the Zone cost centre including authorisation of overtime, travelling and shift allowances,
- ensuring the equipment within the Zone is maintained,
- correlating and supervising leave arrangements, court attendance and other commitments,
- liaising with other Zone Supervisors regarding assistance,
- liaising with Patrol, District, Region Crime Squad and Region Commanders regarding crime scene examination services and requirements,
- identifying human resource needs (clerical, technical and general) on a permanent or temporary basis,
- identifying other resource needs (vehicle, equipment, work accommodation) on a permanent or temporary basis,
- advising Operations Coordinator of staffing, work accommodation, equipment, training and any other requirements of the Zone.

Operations Coordinator

The Operations Coordinator is responsible for the management of the Crime Scene Units (through the Zone structure) and the specialist Units. The Coordinator's role is to maintain uniform standards in crime and incident scene examination services.

Commander, Physical Evidence

The Commander is responsible for providing high quality physical evidence services to Police and the court system.

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General investigations

1.0 Introduction

This section provides the basis of management procedures for general investigations which should be followed at every crime or incident scene.

The following sections, *Specific investigations, Technical examinations, Laboratories and experts, and Disaster victim identification*, provide:

- detailed procedures for specific types of investigations, and examinations,
- specific issues regarding occupational health, safety and welfare, presentation of evidence, and other related issues.

The sections, *Case management, Office management, Equipment management and Work accommodation*, provide additional details regarding administrative procedures which follow the initial scene investigation.

2.0 Scene protection and responsibilities

All members of the Physical Evidence Section are to comply with Circular 91/103, and where appropriate advise other police of their responsibilities at the scene/incident. The circular states:

The First Police Officer(s) at the scene of a crime or incident are responsible for preserving the scene for examination by Crime Scene Examiners. They must:

- assess any **hazards** (eg. electrical, gas, chemical danger) and take appropriate action.
- render, or arrange for, any necessary **first aid or assistance** to any person.
- determine the **nature and size** of the scene.
- determine an **entry point** for the crime scene. (A point not used by the suspect.)
- **remove** all persons from the scene through the entry point and record witness's particulars.

- call for **assistance**:
  - a supervisor (if necessary) to co-ordinate control of scene (Scene Co-Ordinator).
  - crime Scene Examiners (Physical Evidence and Fingerprints).
  - investigators.
- define the scene's boundary with **Scene Tape**.
- **protect** any endangered physical evidence (exhibits) and record any action taken in Official Notebook.
- **record** in Official Notebook all actions of First Officers which may have changed the scene (eg. forcing entry to premises, moving objects).
- continuously **guard** and prevent entry to the scene by any person regardless of rank or status, who does not have a specified task to perform.
- **advise** Duty Operations Inspector (D.O.I.) or Senior Operations Officer (S.O.O.) or Patrol Commander (or nominee) of details of call sign, First Officer's name, location of scene control point and boundary position of scene tape.
- **record** a log in Official Notebook:
  - rank, name, station, time of entry and exit, and reason for specified tasks for **each person** entering the scene until formally relieved of this responsibility.
- **provide all information** to the Senior Investigating Officer and Crime Scene Examiner before leaving the scene.
- to be relieved of recording duties the First Officer must **obtain the signature** of the Senior Investigating Officer in Official Notebook.

Other relevant aspects of that Circular are:

- Whenever a Police Officer attends a serious crime or incident requiring the examination of a scene and/or the recording of physical/fingerprint evidence which could be interfered with, lost or destroyed if not examined immediately, Crime Scene Examiners should be promptly notified to attend.

- The First Officer/s at the scene has the authority and responsibility to undertake scene preservation procedures until relieved of this function by the Senior Investigating Officer assigned to investigate the crime or incident. (Explained in greater detail in Annexure B of the Circular, Refer Appendix B1).

- The Senior Investigating Officer has the overall responsibility to ensure the scene, and any physical evidence is preserved until the arrival of a Crime Scene Examiner. (Explained in greater detail in Annexure C of the Circular, Refer Appendix B1),

- A scene Co-Ordinator may be appointed to a crime/incident scene by a Patrol Commander where the size/complexity of the investigation or the scene warrants this action. (Explained in greater detail in Annexure D of the Circular, Refer Appendix B1),

- Whenever a Crime Scene Examiner is called to an incident, the overall responsibility for the investigation of that incident remains with the Senior Investigating Officer present.

- Crime Scene Examiners will assume responsibility for examining, assessing, recording and collecting any physical or fingerprint evidence available at the scene.

3.0 Initial attendance and liaison

The following is a list of procedures to be followed upon initial receipt, attendance and appraisal of any crime/incident scene:

- record exact time and date of receiving the call to attend crime/incident scene. Confirm that scene protection procedures have been implemented. Request that the First Officer at the scene will remain until your arrival (if possible).

- arrive at the scene as quickly as possible.

- record exact time, date and precise location on arrival at the scene.

- liaise with those Police who have been responsible for the crime/incident scene protection procedures as outlined in Circular 91/103. Ensure compliance with the Circular has been met and obtain all available information about the incident.

- re-assess scene preservation. Where necessary upgrade protection measures and re-establish the scene perimeter.

- assess occupational health, safety and welfare risks to ensure the safety of all persons at/or near the scene. Follow safety precautions (as outlined in *Specific investigations*) depending on the scene.

- establish who may have entered the scene to determine if evidence has been lost, contaminated or may otherwise be misinterpreted at a later date. Consider;

  . emergency personnel (Police, Ambulance, Fire, Volunteers, etc)

  . witnesses,

  . victims,

  . media.

- obtain a copy of the log of events, recorded by the First Officer (which includes all persons entering and leaving the scene).

- determine an entry/exit path to minimise loss of evidence. The path should be determined on the basis that it was not used by the suspect or victim. Before use, the path should be carefully searched for any physical evidence.

- formulate priorities for search, examination and item collection based on the circumstances and condition of the scene. Trace evidence (fingerprints, fibres, shoe prints, hairs, etc) should be given priority for processing.

- do not liaise with media at the scene or thereafter; any requests for information should be directed to the Senior Investigating Officer.

4.0 Request for experts at scene

The Examiner should, in consultation with the Senior Investigating Officer, determine if other experts are required and co-ordinate their attendance. Other experts which might be required to attend the scene include:

Fingerprint Section

The potential for fingerprint evidence must be considered at all crime/incident scenes and arrangements made for a Fingerprint Technician to attend when fingerprint evidence may be available. ***(Likewise, the Fingerprint Technician is obliged to inform the Crime Scene Examiner where other traces of evidence, apart from fingerprints, are found at the scene.)***

- At large, serious or complex crime scenes, the Crime Scene Examiner should process the scene in joint consultation with a Fingerprint Technician. Consultation must take place at the scene regarding the potential for fingerprint and other trace evidence and the sequencing of any examination (refer following section *Analysis options*).

- Where items are collected by the Fingerprint Technician for further examination, the Crime Scene Examiner must obtain a list of those items.

Forensic Ballistics Unit

Police shootings

The Forensic Ballistics Unit must be contacted to attend all Police shootings. (The Crime Scene Examiner must ensure that this Unit has been contacted to attend the scene. Refer Commissioner's Instruction No. 22, amendment in process.)

Suspicious deaths

The Forensic Ballistics Unit must be contacted regarding the scenes of suspicious shooting deaths.

Photogrammetry and Video Units

The Photogrammetry and Video Units are available to all Crime Scene Examiners to attend and record crime scenes if required (refer later under *Recording,* and *Specialist Units - Photogrammetry Unit* and *Specialist Units - Video Operations Unit*).

Vehicle Examination Unit

The Vehicle Examination Unit must be notified of omnibus collisions where the damage to the vehicle is extensive and has involved substantial deaths or injuries.

Government Medical Officer

The Government Medical Officer should be contacted to attend;

- the scenes of all homicides.
- deaths involving suspicious or unusual circumstances which cannot be readily interpreted by the Crime Scene Examiner.

Other experts

Dependent on the circumstances the Crime Scene Examiner should consider the use of other experts (refer ***Specific investigations, Technical examinations*** and ***Laboratories and experts***).

5.0 Recording

Photography

Accurate record

Photographs of the scene must be comprehensive and items of significance photographed to accurately record their position.

The scene must be recorded in detail to show it as it was found by the Examiner.

Re-positioning of items

If a request is made to re-position items moved prior to the Examiners arrival, the following procedure should be followed:

- ensure a photograph has been taken of the item, as found by the Examiner,
- ensure sufficient photographs depict the location where the item was allegedly moved from,
- request that Officer make a note of the item which was moved and why; if required the Officer, should prepare a statement which outlines the circumstances of moving the item,
- the Crime Scene Examiner should also make an official record of the circumstances relating to the movement of items and the photographs taken.

Types of photographs

The following methods should be used to accurately record the scene:
There are basically four (4) types of photographs that should usually be taken:

- **General photographs**:- that show the location of the scene in relation to an identifiable landmark e.g an aerial view; or a view of a building taken from across the street.

- **Mid-range photographs**:-

  . Exterior scene; may record the positions of closely related items of evidence.

  . Interior scene; may record the relative position and layout of rooms, hallways and stairs.

- **Close up photographs**.

- **Technical photographs**: which may assist in identifying and processing physical evidence eg. use of scales, filters, illumination techniques, macroscopic, microscopic photography, etc.

Note taking

At all scenes the Examiner should make detailed notes of observations, items collected and any relevant issues which will have a bearing on the processing of physical evidence including:

- times and dates,

- description of the scene,

- location and collection of various items,

- persons who assisted with the processing of the scene,

- lighting conditions,

- conditions of locks, windows, doors, etc.

- condition of items or objects present at the scene which may relate to the investigation.

Note The above points are only examples. *Specific investigations* and *Technical examinations* include details of matters to be considered at specific jobs and tasks.

All Crime Scene Examiners should be issued with, and maintain, an Official Notebook and Duty Book.

All notes must be retained for Court and, if loose leaf, filed in the case folder together with any other relevant paper work.

At complicated scenes:

- an appropriate form should be utilised to facilitate note taking, eg. the Arson Form for fire scenes.
- a Precis Sheet should be typed on return to the office and:
  - will consolidate the notes taken at the scene into an easily read format.
  - a copy must be provided to the Senior Investigating Officer as a matter of urgency (refer *Case management*).

Plans

Sketch

All scenes should be accurately recorded by way of a field sketch. The sketch should include all relevant information on the processing of the scene.

Crime Scene Examiners should take measurements to produce a plan for:

- all indictable offences,
- any Coronial inquiry where a plan will assist the Coroner.

(Refer *Technical examinations - computer aided drafting* and *Specialist Units - Photogrammetry Unit*).

Photogrammetry

In the investigation of all serious crimes, major incidents and complicated scenes the Photogrammetry Unit should be notified to record the scene, where practical.

Photogrammetry is a very accurate method of taking measurements from photographs to produce scale plans. The Photogrammetry Unit is a State Scarce Resource and is available to all Crime Scene Examiners.

The Crime Scene Examiner will provide a full brief on the incident/scene, the areas to be surveyed, and circumstances relating to the scene to the photogrammetrist.

Video

The Video Operations Unit is a State Scarce Resource and provides the facility to record the scene on video tape for the Crime Scene Examiner.

In the investigation of all serious crime scenes, major incidents, and complicated scenes the Video Unit should be called to attend and record the scene, where practicable.

The Crime Scene Examiner will provide a full brief on the incident/scene and the areas to be recorded to the video operator.

If the Video Unit is unavailable or attendance is impractical, the Crime Scene Examiner may use other video equipment to record the scene.

Master tapes should be held by the Crime Scene Examiner. Any dubbed tapes should only be issued to the Senior Investigating Officer who must sign to receive the tape in the Crime Scene Examiner's Official Notebook or other official record.

The Video Unit also provides a video recording service for a "walk through" with a suspect (refer *Specialist Units - Video Operations Unit*).

Conversation

Avoid entering into conversations with persons other than Police, Emergency or other official personnel.

Any conversation with such persons should be handled by the Senior Investigating Officer. Request that the Investigator ask the questions you need answered.

You may be present with the Investigator while questions are being asked. Any further questions arising as a result of those answers can be related to, and asked by, the Investigator.

In circumstances where this is not possible or practical, the conversation should be recorded in your Official Notebook and where possible a signature obtained from that person.

In matters where the conversation may lead to incriminating evidence the official caution should be administered.

6.0 Searching the scene

Depending on the scene, the Crime Scene Examiner may undertake, or co-ordinate a search of the scene.

The search pattern or method used should be based on assessment of the scene in consultation with the Senior

Investigating Officer.

The area/s to be searched will be determined by:

- nature of the offence or incident,
- nature of the physical evidence,
- location,
- terrain,
- established facts

One of the following methods should be used when carrying out the search of a scene:

- **lane search** - divide the scene into lanes and search each lane,
- **grid search** - divide the scene into a grid and search each square within the grid,
- **zone search** - divide the scene into zones and search using a number of personnel within a zone. This type of search may involve many Police in line covering an area in one sweep. This is a useful method for searching large areas.
- **spiral search** - start from a central point and search the scene spiralling outwards.

7.0 Legal requirements

The law regarding powers to search persons and premises is a combination of statutory law, common law, case law, departmental policy and Police practice.

Generally the following points should be observed, but the circumstances of individual cases may well influence the extent to which these powers may be exercised. Always consult with the Senior Investigating Officer before undertaking searches of premises or persons.

General powers to search premises and persons

Generally, the power to search premises and collect items can be is based on any one, or a combination of, the following

circumstances:

- reasonable grounds for believing that a serious offence has been committed,
- reasonable grounds for believing the item is the instrument by which the crime was committed,
- the item/s to be collected are the proceeds of the crime,
- it is reasonable to believe that the person in possession of the item/s has;
  - committed the crime,
  - is implicated or is an accessory to the crime,
  - or the refusal to submit the item is quite unreasonable.
- police must not keep an item , nor prevent its removal for any longer than is reasonably necessary to complete their investigation or preserve it for evidence. The item or exhibit should be returned to the owner as soon as possible. A receipt must be obtained from the owner.

Specific powers to search persons

Common law If Police have arrested a person, they may search that person and seize:

- items relevant to the crime for which the person was arrested,
- items possessed by the arrested person with which that person might seek to harm himself/herself,
- items possessed by the arrested person with which he/she might seek to effect an escape from custody.

Where the arrest occurs on the persons premises, those premises may also be searched for items relevant to the crime for which the person was arrested.

Statute law Section 353A(1) of the Crimes Act: provides for a statutory power to search a person where the person is in lawful custody upon a charge of committing any offence or crime.

A prisoner should not be searched unless the prisoner knows in substance the reason for the search.

Where practicable, searches should be conducted by a Police Officer of the same sex as the prisoner and wherever possible in the presence of another Police Officer or independent person of the same sex.

Female suspect

Where the person is a female, and no female Constable is available, any female acting under and in accordance with the request of a Constable may conduct the search.

Trace evidence on arrested persons

Searches should be confined to a "frisk search" unless the seriousness and urgency of the circumstances require and justify a more intrusive search of the surface of the body, eg. swabbing a suspect's hands for blood during a homicide investigation.

Medical examinations

Section 353A(2) of the Crimes Act provides for medical examinations. These examinations are generally required for serious crimes where it would be reasonable to expect that the examination may provide further evidence. Typically this will occur with offences such as serious assault, (including sexual assault) and homicide investigation (refer *Specific investigations - examination, medical examinations*).

Seizures under warrant

Under the provisions of Section 7 of the Search Warrant Act a member of the Police Service executing a warrant:

- may seize a thing mentioned in the warrant,

- seize any other thing not mentioned in the warrant which was found during the execution of the warrant and a member the Officer has reasonable grounds for believing that it is connected with any offence.

Search of persons during execution of warrant

Under the provisions of Section 8 of the Search Warrant Act a Police Officer executing the warrant:

- may search a person found in, or on, the premises whom the officer reasonably suspects of having a thing mentioned in the warrant.

8.0 Examination

Before any item is moved or collected, (and after photographing) further consideration should be given to trace evidence (particularly fingerprints) which may be contaminated or destroyed during handling or examination.

If fingerprint evidence is likely to be present, a Fingerprint Technician should attend the scene. The Examiner and Technician should examine the scene together.

If no other trace evidence is present, or is likely to be destroyed through handling, items can be moved, examined and collected.

When an item is moved, an examination should be made of the immediate area from where it is collected for any other trace evidence.

All evidence should be recorded at the time of examination.

If trace evidence is attached to the item being collected it should be recorded, and if likely to be disturbed in transit, it should be removed from the item and packaged separately.

All items even when packaged should be handled carefully to preserve the value of the physical evidence.

9.0 Responsibilities for handling of items

Commissioner's Instruction No.78 provides procedures for the handling and collection of exhibits. The procedures outlined in this manual are an extension of those instructions and apply to all Physical Evidence Officers.

Overall responsibility

When a Crime Scene Examiner attends and examines a scene then the Crime Scene Examiner (Physical Evidence) will be the coordinating person responsible for all physical evidence involved in the investigation.

The Crime Scene Examiner will assume responsibility for examining, assessing, recording and collecting all physical evidence at a scene (except fingerprint evidence where a Fingerprint Technician attends). Where a Fingerprint Technician attends the scene and collects items, the Crime Scene Examiner should keep a record of those items.

At scenes where evidence is collected by a Crime Scene Examiner, that Examiner will be the only link (unless exceptional circumstances exist) between the Investigator and the laboratory for the submission of items, information on progress and receipt of analysis results.

Expert consultants

Where possible the N.S.W. government laboratories (eg. Division of Analytical Laboratories) should be used for analysis of items.

If 'external' experts or consultants are to be used the procedure outlined in *Laboratories and experts* is to be followed.

General considerations

The analysis of any item submitted by the Examiner should, where possible:

- not be totally destroyed,
- in cases where the item or evidence may be totally destroyed in examination or analysis, the Senior Investigating Officer should be informed and a joint decision made in consultation with the relevant expert.

Note: The Division of Analytical Laboratories, Lidcombe is aware of these requirements but other external laboratories and experts should be advised.

Analysis options

When an item has the potential to undergo two or more types of analysis, which may destroy other evidence during the analysis process, the relevant experts and Senior Investigating Officer should be consulted to determine;

- the possibility of loss of evidence from either analysis, separately and or combined,
- the potential and importance of either analysis, to the investigation,
- course of action to be taken regarding the two potential analyses.

Retention and disposal

Items should be returned to the Senior Investigating Officer, when:

- all analyses and any other potential analyses have been completed,

- the matter has been finalised at Local Court (ie. case dealt with or committed for trial).

Items may be retained by the Crime Scene Examiner:

- if after consultation with the Senior Investigating Officer it is considered necessary because of the serious nature of the crime, e.g. murder, unsolved serious offence,

- the importance of the items with regard to the potential value of the physical evidence,

Items should not be disposed of unless a written report is submitted by the Senior Investigating Officer and approved by a Commissioned Officer.

- Valuable items should not be retained by the Crime Scene Examiner, unless under exceptional circumstances (refer Commissioner's Instruction No.78).

10.0 Labelling of items

Upon collection of an item at the scene, a label should be attached to the package displaying the following information:

- time and date collected,

- by whom collected and the initials of the collector next to that entry,

- type of incident,

- job number,

- description of item collected,

- general location, e.g. street address,

- location of the item to an identifiable object or feature at the scene, e.g. near front door,

- if handed the exhibit by another person, the name of that person,

- names of suspect/s (or defendant/s, if applicable) and victims,

- names of investigating Police and their Patrol,
- name/s of the Crime Scene Examiner/s.

If time is not sufficient to transcribe the above information during collection, the collector's initials and the time of collection should be recorded on each package and a suitable mark made to later identify each item.

Typewritten labels

An item which will require laboratory analysis, or later be produced at Court, (including Coronial matters) should display a typewritten label. If an item is to be repackaged to facilitate the attachment of the label, the original packaging should not be disposed of, but resealed within the new packaging.

11.0 Collection and packaging of items

There are various methods for collecting and packaging different types of physical evidence. (These methods are explained in *Specific investigations, Technical examinations* and *Laboratories and experts*.)

The following general procedures should be followed for the collection and packaging of all items:

- all items must be packaged separately to avoid cross contamination with any other item,
- each package must be sealed to prevent loss of evidence or external contamination,
- upon returning to the Crime Scene Unit, all items must be recorded in the Items Register Book,

Further examination and removal of items from their original packaging should be done under controlled conditions with precautions taken to avoid contamination or loss of evidence. The following procedures should be followed:

- items should, as much as possible, remain in their original condition and handled with care. (Protective clothing should be worn to avoid external contamination and to meet Occupational Health & Safety requirements, where applicable),
- examine items on clean paper sheets in well ventilated areas away from drafts. If any material detaches from an item (and it is not to be collected or further examined) it

should be replaced in the original packaging,

- retain the original packaging of all items, (seal in new packaging if original packaging is to be replaced),
- maintain a detailed record of all examinations.

12.0 Continuity and record keeping of items

Continuity refers to the link between the collection of items and any subsequent movements of those items until the final court hearing.

Movement of items from the Crime Scene Unit must be accurately recorded in the Items Register.

Movement and handling of items by other persons should be kept to a minimum.

All items must be secured in the Crime Scene Unit's Exhibit Room or other secure place when not being examined.

13.0 Continuing liaison

Responsibility lies with the Senior Investigating Officer to promptly inform the Crime Scene Examiner and Fingerprint Technician of progress of the investigation (such as pertinent developments, location of further items of physical evidence, arrest of suspect, earliest warning of paper committal service dates, court dates, plea, etc.).

Similarly, the Crime Scene Examiner is responsible to promptly provide the Senior Investigating Officer with details (preferably in writing) of any developments including; results of own and laboratory examinations, preparation of plans, etc, on all physical evidence aspects of the investigation.

In serious matters, and/or where the suspect is arrested shortly after the offence, details of the examination should be provided, in writing, to the Senior Investigating Officer as a matter of urgency.

14.0 General preparation and presentation of evidence

The Crime Scene Examiner may carry out a number of technical examinations during the course of an investigation. At the end of

each sub-section in *Specific investigations* and *Technical examinations,* is information concerning brief preparation and presentation.

The following addresses only general issues relevant to the presentation of physical evidence, to the Court by the Examiner.

Qualifications and experience

The Crime Scene Examiner should produce a statement with an opening paragraph outlining their experience, qualifications and any other training relevant to the type of incident and opinion/expert evidence given.

Statement format

Generally statements, should be prepared setting out:

- tasks carried out, in chronological order,
- the nature and extent of the examinations,
- a detailed description of the features of the scene and where appropriate be supplemented with photograph/s, charts, diagrams, plans, etc.

Photographs

Photograph/s must be produced after providing a detailed verbal description (in the statement) of what the photograph/s depict.

Photographs should display a label with a number at the front and a caption placed in a position which can be read from the front or rear of the photograph. The caption should be removable without causing damage to the photograph.

Charts

Various charts or diagrams may be used as aids to provide visual information to assist the Court,

- brief descriptions should only be provided to identify the object or feature depicted.
- detailed or conclusive descriptions/opinions should be included in the Examiner's statement, not on the chart or diagram.

Opinion evidence

Any opinions that are expressed in a statement should be based on provable facts. The Crime Scene Examiner must demonstrate to the Court that the opinion is based on expertise on the area in which the opinion is being given.

Qualifications and experience in the area should be provided in the statement (refer *Laboratories and experts* and *Technical examinations*).

Table of contents

Specific investigations

Introduction

Structure

This section builds on the general procedures outlined in the previous section *General investigations*.

The procedures in this section have been divided into two parts:

- person related incidents, and
- property related incidents.

Occupational health, safety and welfare

Each division (person and property related incidents) begins with specific occupational health, safety and welfare issues. For example, person related incidents have biological hazards associated with investigating incidents such as assaults and deaths. In addition, where there are specific incident related hazards these are addressed at the beginning of the procedures for that type of investigation.

This structure for addressing the important issue of the Examiner's wellbeing has been developed to draw attention to the main risks. Because of the diverse nature of crime and incident scenes, under any particular category, it is not possible to cover all contingencies. The Examiner may need to apply the OH&S procedures from one part of the Section to an investigation discussed in another part, e.g., a break and enter scene may contain biological hazards where the offender bled climbing through a broken window.

Types of investigations

Following the OH&S measures there are detailed procedures for specific types of investigations. Where appropriate these procedures are cross referenced to the Commissioner's Instructions and any relevant legislation.

These procedures are not designed to be a training package. They outline the professional approach to crime scene examination expected of Officers in the Crime Scene Units of

the Physical Evidence Section.

The procedures cover initial considerations prior to entering the scene, recording and examination of the scene and post scene examination and procedures.

Person related incidents

Occupational health and safety

The typical hazards in investigating person related incidents are biological hazards.

Biological hazard procedure

Vaccination

It is strongly advised that all Crime Scene Examiners be vaccinated for the Hepatitis B virus before attending the scenes of deaths or handling blood or body tissues. The series of vaccinations must be followed by testing to ensure that the inoculation has been successful.

Protective equipment and clothing

At the commencement of daily duties all Crime Scene Examiners must maintain a personal issue of the following items and clothing:

- 1 litre container of 'Hibicol' solution,
- 1 litre container of 'Bioprep'
- 2 litre container of fresh water,
- eye wash bottle containing fresh water,
- first aid kit containing waterproof bandages such as 'Opsite' or 'Airstrip',
- 1 litre container of household bleach,

- three (3) complete sets of well fitting disposable biological hazard suits which includes:
  - . disposal overall with hood,
  - . face mask,
  - . latex gloves,
  - . shoe covers,
  - . goggles,
  - . contaminated waste bag,
- five additional well fitting pairs of disposable gloves,
- five additional pairs of disposable goggles,
- five 'sharps' containers for collection of hypodermic syringes

The crime scene vehicle must also carry a five (5) litre (tap operated) container of fresh water.

Attending the scene

Before entering the immediate location consider the following:

- any blood, other body fluid and tissue must be treated as a biological hazard,
- any deceased person must be treated as a biological hazard - even if the death was not violent,
- preclude all persons (including other Police) from entering the scene if not wearing appropriate protective clothing,

Wearing protective clothing

- protective clothing must be worn at all scenes of deaths or where there is large amounts of blood or other body fluids. Clothing to be worn is:
  - . disposal overall with hood,
  - . face mask,
  - . latex gloves,

- . shoe covers,
- . goggles.

- before putting on protective clothing roll the top of the contaminated waste bag in the kit about 30cm on the outside,
- wash hands and arms (which will be covered by gloves) with 'Hibicol' to identify cuts to the skin,
  - . all cuts and scratches to the hands are to be covered with waterproof dressing e.g. 'Opsite or 'Airstrip',
  - . gloves should be well fitting and be changed (as set out below on decontamination procedures) if visibly contaminated, breached or torn,
  - . if the scene does not involve the examination of deceased persons and only small amounts of blood or other body fluids are present it is not necessary to wear the full biological suit. However, gloves, face mask and goggles should be worn when collecting samples.

Additional precautions

- camera or other equipment should not be handled while wearing protective gloves which may have become contaminated by biological hazards,
- hands should always be washed using disinfectant or soap ('Bioprep') after removing gloves,
- eating, drinking or smoking is prohibited in the scene or while wearing protective clothing. Avoid hands touching the face, particularly eyes, nose and mouth.
- any blood splashes should be washed off immediately with a solution of 1 part bleach to 10 parts water,
- during searching procedures be careful to avoid syringes or any other sharp instruments at the scene. Take extreme care searching a person's clothing - do not place hands in their pockets, rather use tweezers and or similar instruments to collect or identify items which are concealed from view.

First aid

If accidental 'needle stick' injury, cut, splash to the eye, nose or mouth occurs:

- promptly wash or wipe away the blood or substance,
- encourage bleeding,
- wash and flush the cut or puncture with copious quantities of soap and water or 'Bioprep' (if not available use water),
- if splashed in the eyes - rinse with a saline solution or lots of clean water,
- if blood gets in the mouth - spit it out and then rinse mouth out with water several times,
- if blood gets on the skin - but there is no cut or puncture, wash with soap and water.

Decontamination

Decontamination procedures should be followed upon leaving a scene or changing contaminated protective clothing in the following manner:

- remove clothing away from contaminated area,
- if gloves are badly contaminated - remove first (in manner described below) and replace with a fresh pair, then,
- remove face mask by handling only contaminated outside surfaces and place in contaminated waste bag,
- remove goggles by handling only contaminated outside surfaces and place in contaminated waste bag,
- remove overalls by handling only contaminated outside surfaces and place in contaminated waste bag,
- remove shoe covers by handling only contaminated outside surfaces and place in contaminated waste bag,
- finally remove gloves (even if changed immediately before removing overalls):
  - remove first glove by pinching the wrist section below the edge and rolling inside out,

- remove second glove by placing fingers inside the wrist section and rolling inside out,
- gloves should be handled by only the inside uncontaminated surfaces and placed immediately in the contaminated waste bag.

- waste bag should be rolled up from inside the area which was rolled down prior to putting on the protective clothing, sealed and conveyed to a morgue or hospital which handles the disposal of biological waste.
- any equipment which becomes contaminated with blood or body fluids should be washed in a solution of 10 parts water to 1 part bleach before being placed in the kit or vehicle,
- protective equipment and clothing should be replenished (personal and vehicle issue) as soon as possible.

Chemical hazards

Crime scenes

At all crime/incident scenes; avoid any unusual or unknown liquids, solids or gases which may be a chemical hazard. (no matter how small in quantity)

Evacuate the scene.

Immediately call the Fire Brigade and organise cordons till the arrival of Fire Brigade Officers who will handle and or provide advise.

If contact with an unknown substance or gas which may be a chemical hazard occurs seek medical advice immediately.

1.0 Assault

This section outlines procedures for both assault and sexual assault investigations. Related sections which should be referred to include: ***Biological hazards, Biological specimens, General investigations*** and ***Death*** (for serious assaults).

1.1 Safety precautions

Take the necessary precautions to avoid unsafe handling of blood and other body fluids (refer ***Biological hazards***)

1.2 Initial attendance and liaison

Liaise with First Officers and Senior Investigating Officer regarding;

- the nature of the injuries to the victim,
- the facts surrounding the assault and determine priorities for collection of items at the scene,
- the collection of victim's and suspects clothing as soon as possible to avoid loss of evidence,
- if victim has been taken to hospital; make immediate arrangements to collect victims clothing, personal items, etc. for later examination,
- if possible request that medical staff collect any other trace evidence which may be present in wounds or on the surface of the victims body,
- the Police Forensic Medical Officer (from the Clinical Forensic Medicine Unit) can be contacted regarding appropriate medical forensic management of the victim and may advise generally or liaise with the hospital medical officer in relation to the recording and collection of relevant forensic medical information and other evidence,
    - clothing or items may be collected by the Crime Scene Examiner or other police,

- obtain the names of hospital staff who hand clothing and other items over, record time and date of receiving,
- where a blood transfusion has been given arrangements should be made with hospital staff to obtain a pre-transfusion blood sample, (if groupings are required)

- the extent and boundaries of the scene,
- witnesses' versions of events,

1.3 Recording

Photography

Scene Include photographs of the scene from positions identified by any witnesses (refer *General investigations*).

Photographing victims Permission to photograph and record injuries must be obtained from:

- the victim,
- if victim is admitted to hospital also from the Medical Superintendent.

Photographs are to be taken in the following manner:

- arrange for the most appropriate time for photographs to be taken, consider;
  - whether injuries are bandaged and should be photographed during dressing change. Liaise with victim or medical staff at hospital,
  - when victim is being photographed for forensic purposes it should be done (when and where practically possible) in the presence of the examining medical officer and while he/she is recording his/her clinical findings.
- consider degree of bruising and time of assault, (bruising injuries may not become visible till later). Liaise with medical officer,
- identify the victim: full length (where possible) and face,

- where the victim is still wearing the clothing alleged to have been worn at the time of the assault, take mid range and close up photographs before the victim changes clothing,

- where the victim is still wearing the shoes alleged to have been worn at the time of the assault, show the type, any visible brand or design names and the sole. Where possible for later elimination or confirmation with prints found at scene.

- when clothing is removed, photographs should be taken to show the front and back including any identifying marks or labels and physical evidence,

- take general and mid range photographs to locate injuries relative to identifiable parts of the body,

- assess if injuries are peculiar to a weapon or other item suitable for comparison and take close up photographs of injuries using a scale, (eg. bite marks, stab wounds, impact impressions. Refer *Technical examinations - comparisons*),

- any trace evidence taking both mid range and close up photographs,

- where possible, take photographs to show comparative injured and uninjured parts of the body eg. swollen left hand with uninjured right hand to show the extent of swelling.

Photographing suspects

Photographs are to be taken in the following manner:

- handcuffs should be removed prior to photography unless suspect is violent (be guided by the Senior Investigating Officer and arresting police),

- full length and both profiles,

- injuries and any trace evidence as outlined in *Victim photographs*.

- if the suspect's shoes are to be compared with prints from scene, photograph them on the suspect to show the type, any visible brand or design names and sole,

- if the suspect is to undergo a medical examination liaise with the doctor as to photographs required to assist with recording the results of the examination.

Note taking

Take detailed notes of:

- the scene (refer *General investigations*),
- details regarding the victims and suspects including the location, size and type of:
  - clothing,
  - injuries,
  - any physical evidence,
  - complete and anotomical chart showing location of injuries etc and where possible have suspect/victim sign same.

Plans

All assault scenes should be sketched and relevant details measured (refer *Technical examinations - sketching and drafting*). Plans should be provided to the Senior Investigation Officer for all indictable assault offences.

Measure and plot the location of witnesses at the time of the alleged offence (liaise with the Senior Investigating Officer for details).

1.4 Examination

Examination of persons

- collect victim's and suspect's clothing (including shoes) for examination of possible trace and other evidence e.g. blood, hair, fibres, soil,
- determine what analysis should be carried out dependent on circumstances surrounding the assault,
- if considered beneficial, have victim or suspect stand on a clean sheet of brown paper to avoid loss of evidence when collecting trace evidence and clothing,

Examination of clothing

Clothing should be photographed to show:

- entire front and back,
- any labels,
- identifying features,

- damage (with a scale if appropriate),
- shoes (victim's or suspect's) to show the soles preferably while worn,
- all trace evidence before collection.

Medical examination

Liaise with the Senior Investigating Officer regarding the medical examination of suspects. Discuss what evidence may be gained having regard to the circumstances of the investigation.

Refer to Circulars 83/376 and 84/97 and Section 353A (2) of the Crimes Act 1900 (See Appendix C1).

Always attempt to gain permission from the subject for a medical examination prior to using Section 353A (2) of the Crimes Act.

While medical practitioners will carry out this procedure against the consent of the subject they will still need to have his/her (the subject's) submission.

The act of taking a specimen from or carrying out any examination of a struggling subject is not only medically unethical but also dangerous. There is also a real question of assault should any injury to the subject arise from such an exercise.

If in doubt, liaise with the Police Forensic Medical Officer as well as the other persons as directed.

Before a medical practitioner is requested to undertake an invasive medical examination (including blood sample) for the purpose of obtaining evidence, the Senior Investigating Officer must consult with:

- a Commissioned Officer from Legal Services, or if unavailable then,
- a Duty Detective Inspector, if unavailable then,
- the Duty Operations Inspector (D.O.I.).

If approved by one of the above Officers, then:

- contact the Police Medical Officer at the Clinical Forensic Medicine Unit, if unavailable then,
- Government Medical Officer, if unavailable then,

- other Medical Practitioner.

Provide the Medical Practitioner with details of the incident including any relevant biological evidence which has been collected from the scene or other location.

1.5 Packaging and labelling

Collect and package trace evidence using the procedure appropriate to the item (refer *Technical examinations* and *Laboratories and experts*).

1.6 Presentation of evidence

Statement

Include:

- detailed description of the scene,
- brief description of the victim's and suspect's injuries and general location on body,
- results of examinations of the scene, victim's and suspects,
- results of trace evidence examinations carried out by Examiner,

Attach:

- sketch, CAD or scale plan,
- scientific report from government analyst or other expert.

Sexual assault

Additional procedures to those outlined for *Assault* are required for sexual assault investigations.

Initial attendance and liaison

All aspects of the Crime Scene Examiner's duties must be undertaken with consideration to the victim's welfare and emotional state of wellbeing.

Victim care and support must be paramount.

Liaise closely with the Senior Investigating Officer or Initial Response Officer (IROC) regarding:

- facts surrounding the alleged sexual assault, including ejaculation of semen,
- whether the victim has any visible injuries,
- whether the victim gives permission to be photographed,
- any trace evidence on the victim or clothing (other than that collected in the Sexual Assault Investigation Kit),
- if victim has lost any personal effects or jewellery at the scene,
- whether a facial identification (Penry Photo-fit) should be completed, where suspect not known by victim,

Examination

Scene

Search for trace evidence at the scene including:

- fibres,
- hairs,
- semen, blood and other body fluids,
- personal effects, jewellery, buttons, consider offender and victim,
- shoe prints,

- forced entry to building or premises.

Victim

Consider any evidence which may be lost during the victim's travel to the Sexual Assault Unit or hospital. Collect, or arrange for the victim's clothing to be collected by the IROC Officer, considering the victim's needs and emotional wellbeing.

The Sexual Assault Investigation Kit and other biological items should be:

- collected from the IROC Officer or Senior Investigating Officer,
- appropriately handled and packaged (refer ***General investigations*** and ***Laboratories and experts***),
- forwarded by the Crime Scene Examiner to the Forensic Biology Laboratory,

Suspect

Search for and collect items:

- which may have transferred to or from the suspect at the scene,
- suspect's clothing (including shoes) and package,

Consider medical examination (and blood sample) (refer *Assaults,*).

Clothing

Examine clothing under controlled conditions for trace evidence (refer *Technical examinations*),

Bedding

If the sexual assault has occurred on a bed, mark the bed linen to identify its' orientation:

- relative position i.e., top sheet, bottom sheet, quilt,
- orientation, e.g., corners of sheet fitted to the head of the bed, the foot of the bed; top and bottom side of the sheet,
- location of physical evidence.

APPENDIX C1

Circular No 83/376

POLICE DEPARTMENT
COMMISSIONER'S OFFICE
SYDNEY 2000
File No. SMMI S73603/228

4th January 1984.

Taking of blood samples and invasive medical examinations for the purpose of obtaining evidence of the commission of criminal offences.

Section 353A(2) of the Crimes Act, 1900 provides for medical examination of persons in lawful custody in certain circumstances. This section authorises only such examination as is reasonable in order to ascertain facts which may afford evidence as to the commission of the crime or offence.

The section does not authorise a general practice of obtaining blood samples from persons in custody or subjecting them to other forms of invasive medical examination.

An examination may proceed beyond mere scrutiny of the person, and extend to the taking of specimens or the recovery of foreign bodies where those specimens or bodies may afford evidence of the charge question.

Whether a proposed examination is reasonable is a question of fact and degree which depends on all the circumstance s of the particular case. It would be unwise to attempt to lay down, in the form of a code, a series of tests by which the reasonableness of a proposed examination should be determined. The limits of reasonableness may vary markedly and depend, inter alia, upon such matters as the extent to which the examination will invade the integrity of the body, the state of health of the prisoner, the seriousness of the charge, the cogency of the evidence that there are reasonable grounds for believing that the examination will afford.

Before a medical practitioner is requested to undertake an invasive medical examination or take a blood sample investigating police shall confer with a commissioned officer from the Police Prosecuting Branch (now Legal Services at the Region). Where an officer from that Branch is unavailable contact is to be made with Duty Operations Inspector for the purpose of obtaining advice as to whether the proposed examination is justified.

In the metropolitan area the Forensic Unit of the Police Medical Office (now Clinical Forensic Medicine Unit) will be used for the carrying out of the required procedures. Elsewhere the Government Medical Officer or private medical practitioners may be utilised.

Contact can be made with the Police Medical Officer at any time through the Duty Operations Inspector on 20966 extension 3120.

(See Circular 84/97)

C.R. Abbott
Commissioner

APPENDIX C1

Circular No 84/97

POLICE DEPARTMENT
COMMISSIONER'S OFFICE
SYDNEY 2000

File No. SMMI S73603/228

23rd March 1984.

Taking of blood samples and invasive medical examinations for the purpose of obtaining evidence of the commission of criminal offences.

Instructions are contained in Circular 83/376 that before a medical practitioner is requested to undertake an invasive medical examination or to take a blood sample for the purpose of obtaining evidence, contact is to be made by investigating police with a commissioned officer from the Police Prosecuting Branch (now Legal Services at the Region).

In future, when an officer from the Police Prosecuting Branch (now Legal Services at the Region) is not available, contact is to be made with the Duty Detective Inspector. Should such officer also be unavailable, then the Duty Operations Inspector is to be contacted.

A suitable notation is to be made on Circular 83/376 which is to be endorsed "See Circular 84/97".

C.R. Abbott
Commissioner

APPENDIX C1

CRIMES ACT 1900 NO.40 SECTION 353A(2)

(2) When a person is in lawful custody upon a charge of committing any crime or offence which is of such a nature and is alleged to have been committed under such circumstances that there are reasonable grounds for believing that an examination of his person will afford evidence as to the commission of the crime or offence, any legally qualified medical practitioner acting at the request of any officer of police of or above the rank of sergeant, and any person acting in good faith in his aid and under his direction, may make such an examination of the person so in custody as is reasonable in order to ascertain the facts which may afford such evidence.

2.0 Death

Deaths investigated by the Crime Scene Examiner can be divided into two categories:

- cause of death unknown,
- suspicious (homicide).

Initially, (and regardless of the probable category) the Crime Scene Examiner must treat every death investigation as a **cause unknown** to ensure that no vital evidence is lost and particularly so if the investigation reveals suspicious circumstances.

The following sub-sections outline procedures which allow a chronological and methodical approach to the investigation of deaths on the basis that every death investigated may be suspicious.

Later sections discuss in detail the procedures which should be followed for specific circumstances. The final sections outline additional procedures for the investigation of suspicious deaths when homicide is confirmed or likely.

2.1 Safety precautions

Take the necessary precautions to avoid unsafe handling of the deceased, blood and other body fluids. The complete disposable biological hazard suit must be worn (Refer to section on *Biological hazards*).

Cause of death unknown

2.2 Initial attendance and liaison

- liaise with First Officers and Senior Investigating Officer. Make immediate evaluation from known facts:
  - determine the circumstances surrounding the death,
  - determine if there are any suspicions relating to cause of death,
  - establish if persons have contaminated the scene, interfered with the deceased or other physical evidence at the scene (including Ambulance, Fire Brigade, other Police, witnesses etc).
- ensure that all relevant information is obtained from all persons who entered the scene including:
  - what was touched,
  - moved,
  - where they walked (examine their shoes for elimination of any shoe prints),
  - other trace evidence they may have introduced to the area, eg. hair, fibres etc.

2.3 Request for experts at scene

Co-ordinate the expert's attendance to minimise their waiting time.

Government Medical Officer

If the death scene reveals suspicious or unusual aspects, the Government Medical Officer (or medical practitioner from the Clinical Forensic Unit if unavailable) should be requested to attend the scene.

Fingerprints

Ensure that the Fingerprint Section has been notified to attend the scene of suspicious or unusual deaths. Await their

attendance and discuss the incident before examining the scene.

Other experts

Other experts (depending on the circumstances) such as Forensic Ballistics, Photogrammetry and Video Operations Units, external technical experts eg. electrical, gas inspectors should be notified to attend the scene (refer ***Manner of death***).

In cases were the cause of death does not appear suspicious adopt the recording and examination procedures outlined below for 'cause of death unknown'.

2.4 Recording

Photography

Photographs should be taken at two stages to record:

- the scene as found on initial attendance,
- any further features revealed during examination of the scene and deceased.

Coverage

Completely cover the scene and record:

- how the deceased may have arrived at the location,
- possible points of entry to the premises - forced or otherwise,
- items in unusual locations,
- items or features which reflect the mode and manner of death.

Video

The Examiner should consider organising video coverage of the scene.

The Video Operations Unit may be called to attend and record:

- large or complex scenes, and
- utilise specialist technical equipment as required.

Deceased

Photographs of the deceased should include:

- overhead photograph of the body taken from the highest position possible (consider using a step ladder),
- series of photographs taken circling the body from four quadrants,
- close up photographs of the body including wounds, unusual marks, signs of trace evidence and any other items of significance on the body,
- where evidence may involve comparisons, photographs so as to produce scaled photographs. (Refer Technical Examinations; Comparisons, Physical fits, Bite marks, Bruises)
- identification photographs:
  - face,
  - profile,
  - identifying features, e.g,. tattoos, scars, deformities, etc.,

  Where identification has not been established at the scene, a Polaroid photograph (if available) should be provided to the Senior Investigating Officer.

Photographs and videos should be taken to the mortuary for viewing prior to and during post mortem exmainations.

Plans

A field sketch should be completed for all scenes of deaths showing location and position of the body and any relevant items or features.

Measurements should also be taken to produce a CAD or scale plan, if required.

Photogrammetry

The Photogrammetry Unit may be called to attend and record:

- large or complex scenes,
- all homicides (the Unit should be notified in these cases).

Note taking

Notes at the scene of death should be extensive and include details of:

- physical features of the environment,
- description of location,
- ambient temperature (where estimated time of death is required),
- items and features which reveal circumstances and manner of death,
- condition of deceased including:
  - position,
  - clothing,
  - anal and ambient air temperature (where estimated time of death is required),
  - general physical condition of deceased incuding descriptions of head, eyes, neck, chest, abdomen, back, legs, arms,
  - injuries and wounds,
  - condition of extremities including hands, fingers, fingernails, eyes,
  - absence or presence of signs of struggle or violence,
  - rigor mortis,
  - livor mortis (lividity),
  - state of decomposition,
  - presence of post mortem bleeding,
  - vomiting,

In cases where the cause of death is not obvious or the death is suspicious, and prior to the post mortem, provide the Senior Investigating Officer and Government Medical Officer with:

- a typed copy of the Homicide investigation form
- a typed copy of the Precis sheet,

2.5 Examination

General examination

At ***all*** death scenes the following procedures must be performed:

Examine and record:

- circumstances and environmental factors at the scene (refer *Circumstances of death*),
- any unusual factors which may help establish the cause of death.

Do not assume the death is not suspicious until a thorough and detailed examination has been conducted.

Examine and record:

- the head for signs of injury, gross fractures to the skull or other cuts and wounds. Run fingers over the scalp to detect abnormalities that may be difficult to see,
- examine the eyes for petechial haemorrhaging,
- examine the neck for bruises or signs of strangulation,
- remove the clothing from the chest, back and extremities to determine the nature and extent of any injuries,
- examine the hands and fingernails for signs of struggle,
- determine and note the extent of lividity and rigor mortis,
- if considered necessary, take anal and ambient temperatures.
- take particular note to observe, record and collect any item that may be dislodged during above exmainations.

Preservation of scene

The preservation of a death scene is crucial to a successful investigation. Vital information can be gained, not only from the scene itself, but also from the body.

- enable the Senior Investigating Officer to view the scene, and exclude all other Police,
- continue the examination as outlined in Suspicious deaths until the manner/cause of death may be determined:
  - by the Government Medical Officer and subsequent post mortem examination,
  - any source of information both physical evidence, or other inquiries,
  - ensure that the scene is preserved throughout the investigation of a death where the cause is unknown as it may still prove to be suspicious,
  - ensure that all physical evidence has been recorded and collected before releasing a scene where the cause of death remains unknown,
  - where lengthy time periods may be involved, a determination to remove Police guards should only be made following consultation with the Government Medical Officer and Senior Investigating Officer. Depending on the nature and complexity of the inquiries the Coroner may also become involved in this decision (refer *General investigations - legal requirements*),
  - co-ordinate liaison with the Senior Investigating Officer, the Government Medical Officer and other technical experts until the manner/cause of death can be established or enquires have been carried out to the satisfaction of the Coroner.

Manner of death

The following specific circumstances are set out below:

Auto-eroticism
Drug abuse and poisoning
Drowning and scuba
Electrocution
Fire
Gassing
Grave sites
Hanging
Industrial
Ingestion (shark)
Jumping or falling from height
Self inflicted injuries (general)
Shooting
Sudden infant death syndrome
Unidentified
Vehicle collisions

IF AT ANY TIME DURING THE INVESTIGATION THE CIRCUMSTANCES APPEAR SUSPICIOUS, ADOPT THE ADDITIONAL PROCEDURES OUTLINED AT THE END OF THIS SECTION (refer *Suspicious deaths (homicide)*).

Auto-eroticism

Auto erotic deaths can occur as a result of inducing asphyxia through different mechanisms. Recorded cases include hanging from a rope, resting the neck over a fixed structure such as a pipe and full submersion. Cases of erotic stimulation have also included use of an electrical current.

Where auto-erotic death is suspected record and examine:

- the layout of the scene including:
  - . privacy of scene,
  - . any specially constructed structure to support the rope, etc.,
  - . evidence of past similar practice, eg. rope marks around a ceiling beam,
- presence and location in respect to the body of:
  - . victim's discarded clothing,
  - . mirrors,

- pornographic material,
- sexual devices or instruments,

- devices used to induce asphyxia,
- any safety mechanisms employed by the victim to prevent death,
- accurate measurements must be taken if rope mechanisms are used (refer *Hangings*),
- on the deceased, record and examine:
  - position of the body,
  - type of clothing worn,
  - bondage devices and how used,
  - marks and bruises that may relate to recent or past auto erotic practice,
  - pay particular attention of access to area and security features.

Drug abuse and poisoning

Morphine (Heroin)

Safety aspects:

- avoid needle stick injuries;
- always search the scene and deceased so your hands will be in view and use extreme caution,
- be particularly aware of biological hazards at these types of deaths, drug users are often infected with the hepatitis virus or may have contracted AIDS. (Refer *Biological Hazards - accidents re treatment*.)

At the scene examine and record:

- location - many overdoses occur where the user finds a private location to conceal the use of the drug,
- presence and location of related paraphernalia - needles, tablets, foils, spoons, tourniquet, matches, water etc,

- needles should be collected and placed in the sharps containers provided by the Section,
  - needles should *not* be forwarded to the Division of Analytical Laboratories, Lidcombe in the first instance, (no longer routinely analysed due to health risks for laboratory staff)
  - retain the needle in the sharps container, (as it can be analysed later, if required)
- position of deceased,
- fresh needle punctures on arms, hands, buttocks, jugular area, feet,
- contusions around recent needle punctures,
- scars and keloids (raised, firm, thickened scar) at injection sites,
- concealed injection sites on tattoos or scars,
- thick veins, near injection sites,
- evidence of malnutrition,

Poisoning - other substances

- use extreme caution when searching or collecting any substance which may be a chemical hazard,
  - containers may be incorrectly labelled,
  - the substance may be corrosive,
  - dangerous fumes may be inhaled,
  - liquids may be absorbed through the skin,
  - further information may be obtained through a pharmacist, Government Analyst, Fire Brigade or poisons information service.
- locate and collect all medications used by deceased,
- locate and collect any chemical substances which may have been used in the poisoning,

- collect glasses, cups or other containers near deceased, ensure that these items and the deceased are finger printed,

- collect any vomitus,

Be guided by circumstances and liaise closely with the Senior Investigating and Government Medical Officer in suspicious cases.

Drowning and scuba

Drowning

Always consider the possibility of foul play as a drowning scene can be easily used to disguise homicide.

Record and examine:

- nature of the scene,

- age of victim and circumstances,

- consider other factors which may have contributed to death by drowning, including alcohol or other drugs,

- examine the deceased - note that petechial haemorrhages are rare in drowning cases even though asphyxia occurs,

- observe and record the presence of persistent tenacious foam in the mouth and nostrils (common in drowning cases),

- consider taking samples of the water for analysis, liaise with Government Medical Officer regarding quantities and location.

Scuba diving

In cases of scuba diving fatalities:

- liaise with Senior Investigating Officer to obtain information on:

  . type of dive, eg. from shore, boat, pier, etc.,

  . use of 'diver below' warning flags, security of anchorage of dive boat, etc,

  . number in dive party,

  . accurate dive profiles (depth, bottom time and decompression stages) for all involved divers,

- experience of deceased diver,
- evidence of alcohol intake,
- determine source of air in tanks (if common source with other divers then check air in those tanks),

• liaise with the Senior Investigating Officer and the Water Police divers locating the body:

- determine if the body was entangled,
- was equipment (face mask, air tanks, regulator and gauges, bouyancy vest, weight belt, wet (or dry) suit, fins, watch, compass, etc. worn correctly and in place,
- could the weight belt buckle be used?
- amount of air in the bouyancy vest,
- tank pressure and position of valve (J or K),
- depth and water conditions (visibility, current, etc),
- water temperature,
- position of the body,
- position of (second stage) mouth piece (in the mouth or out),
- degree of negative buoyancy of body where located,
- accessory items used by the deceased, eg. photographic equipment, torches,
- underwater photographs of body, if possible,

• record and inspect the equipment on the body with the assistance of Water Police divers:

- record brand name, style, model and condition of equipment,

• turn off the tank valve,

• remove the equipment,

- send the tanks to the laboratory for analysis of the air,
- if appropriate, have the equipment tested:
  - forward weight belt to the Department of Weights and Measures to obtain a weight certificate,
  - forward the apparatus to the Water Police to have a qualified member carry out physical tests.

Electrocution

Safety

Use extreme caution. Before anything is touched or examined, liaise with the relevant electricity supply authority or Fire Brigade to ensure that the power source has been disconnected.

Request for experts

Ensure investigating police comply with the article issued 9 December 1991 Police Service Weekly regarding 'Death or accident by electrocution or gassing' ie:.

When a death or accident is brought to the attention of police, whether in domestic or industrial circumstances or in the course of a person's employment and it appears that electrocution or gassing may have caused or contributed to the death or accident, police at the scene are to notify without delay the relevant electricity or gas 'supply authority' of the circumstances and request their urgent attendance and assistance.

In cases where police are of the opinion the circumstances suggest the supply authority may not be regarded as independent to the investigation, ie. where it is suspected the supply source was the culpable factor in the death or accident, police are to notify without delay the Department of Minerals and Energy and/or the Work Cover Authority of NSW and request their urgent attendance and assistance,

In any event, to allow the relevant supply authority to fulfil their statutory obligations, police are to promptly report the circumstances surrounding the death or accident to those authorities.

Except where life saving procedures are necessary and/or there is a need to make the scene safe, any apparatus or articles suspected of causing or contributing to the death or accident are not to be tampered with or moved until all

examinations have been completed by the supply authority and police. (Police Service Weekly, 9 December 1991, p.6, L Stirton, State Commander).

Liaise with investigating police regarding suitable experts attendance at the scene. If necessary make arrangements for an independent expert to attend in conjunction with the Department of Minerals and Energy and/or the Work Cover Authority of NSW (as mentioned above, refer ***Laboratories and experts - experts index***).

In cases of faulty wiring, the Sydney County Council or a similar authority will provide a suitably qualified Inspector to identify incorrect wiring of the premises,

In the case of electrical devices/appliances, the Testing Laboratory at the SCC, Chatswood, should be advised to attend.

Where deliberate booby traps have been set to cause injury, all the experts mentioned above may be required. Liaise with Senior Investigating Officer in this regard.

Record and examine:

With the relevant experts record and examine:

- electrical wiring or device at the scene,
- in detail the area where electrocution may have occurred and the actual contact points on the item which caused the electrocution,
- any results and or specific tests made at the scene by an electrical expert should be recorded by way of photography (where possible) and notes,

With regard to the deceased record and examine:

- the deceased for signs of burn marks which will indicate entry and exit points of the electrical current and photograph in detail,
- if foam is present in mouth (occasionally occurs in cases of electrocution),
- where necessary attend the post mortem and assist the Government Medical Officer,

Lightning

Record and examine:

- arborescent (tree-shaped) markings on the skin,
- clothing (including shoes) which may have be ripped open during the strike,
- disturbance to ground or other objects which may have been subject to the strike,
- any burns or injuries to the deceased,
- condition of metallic objects on deceased - metal objects may be magnetised during the strike.

Fire

Treat as a homicide investigation until facts establish otherwise.

Perform fire investigation procedures (refer *Fire - building, vehicle, bushfire*),

Record and examine:

- deceased person - liaise closely with the Government Medical Officer in unusual or suspicious circumstances,
- thoroughly search and sift through the fire debris particularly in the immediate vicinity where the body is located,

Identification

For identification of the deceased (where there is disfiguring damage to the face):

- perform Disaster Victim Identification procedures:
  - ensure that the jaw bones are recovered for possible dental identification,
  - if the deceased has suffered gross incineration the teeth and jaw bones will be extremely fragile, the Forensic Odentologist must be called to the scene,
  - complete the DVI form as a guide to carrying out an extensive search of the body for items such as clothing, jewellery, etc.,

Post Mortem

Ensure bodies are fully X-Rayed (including extremities) prior to autopsy. Liaise with the Government Medical Officer.

Gassing

Ensure the safety of all personnel:

- Use extreme caution. Before anything is touched or examined liaise with the relevant gas supply authority or Fire Brigade to:

  . ensure that the area is safe to examine.

  . eliminate the gas at the source,

  . ensure that there is adequate ventilation,

Request for experts

Ensure investigating police comply with article issued 9 December 1991 Police Service Weekly regarding 'Death or accident by electrocution or gassing' ie:.

When a death or accident is brought to the attention of police, whether in domestic or industrial circumstances or in the course of a person's employment and it appears that electrocution or gassing may have caused or contributed to the death or accident, police at the scene are to notify without delay the relevant electricity or gas 'supply authority' of the circumstances and request their urgent attendance and assistance.

In cases where police are of the opinion the circumstances suggest the supply authority may not be regarded as independent to the investigation, i.e. where it is suspected the supply source was the culpable factor in the death or accident, police are to notify without delay the Department of Minerals and Energy and/or the Work Cover Authority of NSW and request their urgent attendance and assistance,

In any event, to allow the relevant supply authority to fulfil their statutory obligations, police are to promptly report the circumstances surrounding the death or accident to those authorities.

Except where life saving procedures are necessary and/or there is a need to make the scene safe, any apparatus or articles suspected of causing or contributing to the death or accident are not to be tampered with or moved until all examinations have been completed by the supply authority and police.
(Police Service Weekly, 9 December 1991, p.6, L Stirton, State Commander)

Liaise with investigating police regarding suitable experts attendance at the scene. If necessary make arrangements for an independent expert to attend in conjunction with the Department of Minerals and Energy and/or the Work Cover Authority of NSW (as mentioned above, refer ***Laboratories and expert - experts index***),

Record and examine:

Always consider the possibility of suspicious death (homicide).

Natural gas

Natural gas deaths involves oxygen deprivation and a slow increase in CO_2 levels in the blood. The deceased may show no visible signs of asphyxia.

- an Inspector from gas authority (or independent, depending on the circumstances) should be requested to attend and examine the scene for leaks in any of the lines, gas meter or other appliances,

Carbon monoxide

Carbon monoxide poisoning can occur from burning coal, charcoal, or utilising the fumes from a car exhaust system. Examine and record:

- signs of pink livor to the skin,
- signs of suicide: notes, sealed doors, windows and cracks.
- consider the use of other drugs, alcohol and tablets,
  - record and collect these items.

Other gases A variety of other gases and methods can be used to cause death. Always ensure personal safety by using extreme caution with unknown bottles or containers which may have contained or been used to produce noxious gases. Where the death appears to be of this nature, refer to safety precautions as outlined in *Clandestine drug laboratories*.

Grave sites

When investigating grave sites where bones have been unearthed, it must be considered that the scene could be:

- a homicide burial site,

- archaeological site.

The circumstances of the discovery, the location and any other factors should be considered.

(Refer to *Suspicious death - grave sites* where homicide is suspected.)

Archaeological remains

In cases where it appears that the remains are likely to be ancient aboriginal remains:

- the skeletal remains should remain in situ,
- contact the Regional Office of the National Parks and Wildlife and request that an archaeologist attend the site to determine the aboriginality of the remains,

If (after consultation with the archaeologist) the skeletal remains are of ancient origin there should be no need to report the matter to the Coroner.

- record the scene and any other relevant or pertinent facts,
- the Senior Investigating Officer should:
  - obtain a certificate from the archaeologist stating the ancient origin of the aboriginal remains,
  - liaise with the local Aboriginal Community Liaison Officer for re-burial of remains and general handling of investigation.

Refer to Commissioner's Instruction 120.08

Hanging

Always consider the death could be;

- a homicide, i.e. used to hide manual strangulation, (refer *Suspicious deaths*)
- accidental (refer *Auto-erotic*)
- suicide.

Record and examine

- the deceased in position,
- marks from the rope and any other (suspicious) marks

on the body,

- position and location of the rope for consistency with the circumstances.
- ropes and knots,
- cut the rope away from any knots, preserve for examination by the Government Medical Officer,

Measure the position of the deceased including:

- feet to ground distance,
- rope supporting structure to ground distance,
- length of the rope (supporting structure to deceased distance),
- height of the deceased,
- any other relevant heights eg. chair which may have been used.

Industrial

Liaise with First Officers at the scene and Senior Investigating Officer to determine if criminal investigation is suspected,

Request and liaise with the Work Cover Authority of NSW to determine factors which led to cause of death,

Liaise with Safety Officers (where applicable) employed by the company,

Make evaluation from known facts:

. circumstances surrounding the death,

. any suspicion relating to cause of death,

. ascertain normal work practice and procedures,

. if possible, reconstruct working conditions.

. if electricity or gas is a factor, (refer *Electrical* and *Gas* death investigation in this section for additional procedures)

Record and examine:

- equipment and machinery involved in the death, (utilise external independent experts if required (refer ***Laboratories and experts - experts index***),
- search the deceased for suicide notes, identification, drugs, etc.
- examine the deceased for injuries; determine if injuries are consistent with the type of equipment being operated and the circumstances surrounding the death,

Arrange with employer representatives for technical information (eg. plans) regarding the physical work environment and details of specialised machinery.

Ingestion (shark)

Safety precautions

- digestive fluid within the shark can be caustic and cause burns similar to acids,
- do not allow the stomach contents to come into contact with bare skin,
- if contact occurs, wash effected area in water as soon as possible.

Initial attendance

Most sharks are caught as a result of game fishing or netting.

Establish:

- time, date and place of capture,
- condition of the shark at the time of capture (ie. sick - sluggish, highly active - thrashing, regurgitating stomach contents),

Experts

Consider attendance or advice from:

- marine biologist,
- CSIRO, Hobart on shark biology, migrating patterns and behaviour, (refer *Laboratories and experts - experts index*)
- if found in swimming area, local council beach

inspectors and Surf Life Saving Club,

- N.S.W. Department of Fisheries for tide and current patterns.

Examination

Record:

- physical description of the shark,
- length, weight and species of shark.

Photography:

- full length and other features to facilitate identification.

Record and collect:

- contents of the sharks stomach and digestive track,
- human or other remains,
- stomach should be recovered intact,
- if not possible, the contents should be collected, lightly rinsed in water and placed in a clean plastic bag. Collect all digestive fluid.

Examination should be conducted by:

- marine biologist with a forensic pathologist present,

Missing persons

Inquiries should be made to identify any suspected missing persons or unaccounted crime victims within the surrounding coastal area. (Sharks vary in eating habits and may store remains in an undigested state for up to three months, some scavenge for decomposing tissue).

Jumping or falling from height

Examine and record:

- deceased for any signs of struggle including injuries around the fingers and hands,
- area of exit of the jump for shoe prints, signs of struggle, fibres or any other physical evidence,

Self inflicted injuries (general)

Determine:

- whether the deceased was left or right handed,
- past history of self abuse,

Examine and record:

- deceased,
- scene,
- reconstruct events relating to when and how self inflicted injuries were occasioned,
- liaise with the Government Medical Officer, request attendance at scene if possibility of homicide,

Shooting

Safety considerations:

Before a firearm is moved ensure that it is safe. If uncertain of the weapon and how to render it safe, liaise with a member from the Forensic Ballistics Unit before moving the weapon.

Initial attendance:

Liaise with the Senior Investigating Officer to determine the nature of the death e.g., suspicious, suicide or unable to determine etc.

Police Officer

In shooting incidents where a Police officer is killed/wounded or where a Police Officer/s kills/wounds another person the Forensic Ballistics Unit, Police Headquarters must be contacted immediately.

Suspicious circumstances

When a firearm related murder occurrs in the Sydney Metroploitan area, the Forensic Ballistics Unit will be contacted immediately and attend both the scene and subsequent autopsy.

Outside the Sydney metroploitan area the Forensic Ballistics Unit must be contacted for a murder or any unsuual death beyond the expertise of the Crime Scene Exmainer. Requests for attendance of Forensic Ballistics personnel to areas outside the Sydney Metroploitan area must be referred to the Commander, Physical Evidence Section or delegated officer for

approval.

Examine and record:

- any suicide notes or other letters that may have been left at the scene or other place, consider fingerprint evidence,
- examine and record if it was possible for the deceased to reach the trigger of the weapon used and corresponds with the position of the deceased and other items at the scene,
- collect cartridge cases and projectiles where appropriate (refer *Technical examinations*).
- where circumstances are not unusual or suspicious ensure that the firearm, cartridge cases and projectiles are collected by the Senior Investigating Officer. Advise that Fingerprint and Ballistics examinations should still be carried out and coordinated by the Officer,
- where the death is of a suspicious or indeterminable nature:
  - request member of the Forensic Ballistics Unit to attend and examine (as outlined earlier) ;
    - the scene,
    - firearm, and
    - deceased.
  - request attendance of other experts,
  - request that the Government Medical Officer causes X-Ray images to be taken of body,
  - consider the collection of gun shot residues via the gun shot residue collection kit (refer *Specialist Units - Forensic Ballistics Unit*).

In **all** circumstances advise the Senior Investigating Officer to:

Fingerprints

- arrange for the firearm to be fingerprinted,
- arrange for the victim to be fingerprinted,

Ballistics

- arrange for the firearm to be examined by an expert.

Sudden infant death syndrome (Infant death - cause unknown)

'Cot death' is now recognised as a natural cause of death amongst infants between the ages of 2 weeks and 2 years old and, of apparently healthy babies.

Sudden Infant Death Syndrome is the term used when a post mortem examination has failed to determine the cause of the death.

Refer Commissioner's Circular 92/41.

Initial attendance

Any sudden death of a baby is to be attended to as a matter of urgency (as per Circualr 92/41).

Liaise with First Officer, Senior Investigating Officer and Ambulance Officers who attended. Carefully examine body for any signs of violence (as outlined earlier).

The investigating officer is required to ensure that writ bands (identification tags) are attached to the deceased including details of; name, date of death and signature of police officer who identified the deceased (as per Circular 92/41).

The investigating officer is required to ensure that medical records or hospital notes (if any) pertaining to the medical history of the deceased are placed in a sealed envelope and accompany the body. (as per circular 92/41).

Request for experts

With all suspected SIDS deaths there is an olbigation to notify the duty pathologist at the Glebe morgue (as per Ciruclar 92/41). Inform the pathologist of the circumstances surrounding the death. The pathologist may wish to attend the scene.

Record and examine

Features of the room where the deceased infant was located,

- ventilation,
- ambient temperature,
- general hygienic conditions,
- bed linen,
- any infant drinking bottles or food in cot,

- medications,
- the cot: photograph and take notes and measurements regarding;
  - . heights from floor,
  - . heights and widths of the rails and vertical rungs,
- deceased infant:
  - . any vomitus or other body fluids,
  - . position of deceased,
  - . any injuries to deceased,
  - . clothing worn by deceased infant,
  - . infant may be found to be quite wet; this may be caused by excessive perspiration which is a common feature of cot death,
  - . blueing of the lips and body is also a common feature found in cot death,
  - . ascertain if the infant was breast or bottle fed and time of last feed,
  - . time when infant was last seen alive,

After examination and recording collect:

- the bed linen,
- any infant drinking bottles or food in cot,
- medications,
- any vomitus or other body fluids.

Ensure deceased infant remains in the clothing worn for examination by the pathologist at the post mortem.

Consider all possible causes of death including:

- suspicious:
  - . violence to deceased,

- no signs of violence, it is possible to shake a child to death causing severe brain damage, no external signs of violence may be present,

- suffocation, it is possible to suffocate a child with no signs of external violence,

- obstruction to airways, infants can die form swallowing small items which obstruct the airway,

Discuss with the local Coroner the location of the post mortem, and the desirability for the post mortem to be conducted at the I.F.M., Sydney if required.

Unidentified

Deceased persons can be unidentified due to:

- severe decomposition, or

- no person has come forward to identify the deceased even though facial identification is possible.

Decomposed bodies

If the deceased is badly decomposed the cause of death may be difficult to determine. The circumstances in which the deceased was found may also influence the state of decomposition and physical injuries.

Circumstances may vary from submersion in water, outdoor and indoor locations. Where bodies are badly decomposed, consider the circumstances and available facts. Adopt the appropriate procedures for *Cause unknown*. If the death is unexplained or unusual treat the investigation as suspicious.

Liaise with the Government Medical Officer and Senior Investigating Officer to determine the cause of death and identity of the deceased.

To identify the deceased adopt D.V.I. procedures (refer *Disaster victim identification*). Make immediate arrangements and co-ordinate the following:

- liaise closely with the Government Medical Officer, attend the post mortem and request a full X-Ray of the deceased,

- if the jaw and teeth appear to be fragile notify the forensic odentologist who may attend the scene,

- arrange for a forensic odontologist to examine teeth and complete a dental chart,
- arrange for deceased to be fingerprinted,
- if infested with insect larvae (including fly) collect samples to assist with determining approximate time of death (refer ***Laboratories and experts - entomology***),
- record and examine:
  - deceased for noticeable scars or tattoos, (if possible)
  - hair colour, length and take samples, (if possible)
  - clothing, any brand names, sizes or other identifying features,
  - jewellery.
- supply, as a matter of urgency, to the Senior Investigating Officer all details regarding information which may assist with identification of the deceased, including results of examinations and photographs.

Facial identification

Where facial identification is possible but no person has been forthcoming:

- adopt D.V.I. procedures to record all possible details,
- photograph deceased as per Commissioner's Instruction i.e.
  - clean face,
  - tidy hair,
  - open eyes, if possible,
  - photograph both profiles and portrait of full face
  - supply Senior Investigating Officer with photographs as a matter of urgency,

Vehicle collisions

In some circumstances vehicle collisions have been used to conceal a homicide. Treat single vehicle collisions and incinerated vehicle collision deaths as ***cause unknown*** and

possibly ***homicide***.

Liaise closely with First Officers at scene and any witnesses. (refer ***Vehicle collision*** and ***Suspicious death***).

Train

Refer:

Commissioner's Instruction No. 40.05

Upon notification to attend scene:

- attend scene immediately,
- where suspicious circumstances are suspected, request the train be held at the scene until arrival (where possible),
- where it is thought to be a suicide, accidental or non suspicious death or incident and physical evidence is confined to a carriage (eg. serious assault, sexual assault etc) the train or carriage should be taken directly to a maintenance or siding yard for further examination,
- request the Senior Investigating Officer to:
  - ensure the train is not washed,
  - evidence is protected,
  - if necessary, the train or carriage is placed under Police guard until attendance of the Examiner.

Scene

Safety considerations:

- ensure a member of that authority accompanies the Examiner onto the tracks.
- where dangerous goods are involved in the incident, the Examiner will take direction from the Senior Investigating Officer, SRA officer and NSW Fire Brigade officer.

Record and examine:

- train and carriages involved in the death,
- if the deceased has exited a carriage the carriage and immediate area should be examined,

- search the deceased for suicide notes, identification, drugs, etc.

2.6 Suspicious deaths (homicide)

(additional procedures where homicide confirmed or likely)

A homicide investigation, depending on the circumstances, can centre on any of the procedures already raised in this section and throughout the manual.

Due to the serious nature of the crime and the importance of having a broad and detailed knowledge of crime scene duties, the Unit Leader should be notified immediately when homicide is suspected.

The section *General investigations* and *Specific investigations - assault* provides the basis for the thorough and systematic approach to the investigation of this crime.

The following procedures outline only the key issues which should be addressed during the investigation.

Preservation of evidence

Immediate examination should be carried out of evidence such as shoe prints or other material which may deteriorate if not given immediate attention.

Evidence on deceased

The deceased is the most important exhibit at the scene of the homicide. Consider the presence of trace evidence on the body:

- ensure that all trace evidence has been recorded, collected and properly packaged in labelled containers or other packaging ,
- if required place paper bags over the head, hands and feet of the deceased where there may be trace evidence,
- ensure that the deceased is wrapped in a clean plastic body bag which can later be examined for trace evidence that may have been dislodged during transit,
- when the deceased is removed from the scene examine the area underneath the body,
- preserve the scene until the conclusion of the post mortem and re-examine the scene if necessary relating to post mortem examination findings, continue to confer

and liaise with the Government Medical Officer.

Other evidence at scene

- consider blood splash pattern evidence, (refer ***Technical examinations***)
- consider blood or other evidence (eg. bloodied hands washed in a sink, drugs flushed down a toilet) in plumbing fixtures,
- consider whether the scene should be vacuumed for trace evidence,
- record the positions of locks on doors and windows,
- where forced entry has occurred thoroughly examine the area for trace evidence and jemmy marks (refer ***Break and enter***).

Attending the mortuary

- photograph body before and after removing clothing,
- collect all clothing for further examination,
- collect any other physical evidence which may have been under the clothing or on the body,
- with the Government Medical Officer examine hands for any evidence and take fingernail clippings,
- examine the body with the Government Medical Officer for any signs of trace evidence which may be present in the wounds, hair or elsewhere,
- ensure that the head is shaved for examination of injuries,
- record and collect personal items such as jewellery, wallet etc. and examine for trace evidence,
- consider whether the death is sex-related (whether the victim is male or female) and request the GMO to take anal and vaginal swabs, blood samples and hair samples. Take possession of those samples,
- photograph any unusual bruises or marks with a scale (preferably with right angled graph scale) using a standard lens perpendicular to the injury or mark, (refer *Technical examinations - comparisons*)
- consider photographing bruises using other light sources such as ultra-violet light or Polilight to enhance

detail, (refer *Technical examinations*)

- record details on anatomical forms.

Suspects

Liaise closely with the Senior Investigating Officer regarding the examination of suspects:

- co-ordinate searches of the suspect's premises, vehicle, etc. for physical evidence,
- record and examine the suspect, liaise with the Senior Investigating Officer regarding a medical examination (refer *Assaults*).

Grave sites

The investigation of homicide grave sites involves the following additional procedures:

- the Government Medical Officer must be notified to attend the scene during excavation,
- other experts such as entomologists, botanists, archaeologists, etc should be considered (refer *Laboratories and experts*).

The scene should be photographed:

- prior to excavation,
- during excavation when any object or item is revealed which may provide evidence,
- video recording of the excavation may be beneficial,

Field sketches should be prepared with measurements of all relevant items in and around the grave:

- plan view,
- cross section/s through the grave.

Plans should be prepared with elevations.

Photogrammetry should be considered.

A systematic search of:

- areas on, near and leading to the vicinity where the deceased is buried to locate any other items of evidence such as tyre and shoe impressions, weapons etc.,

- section the site into an organised grid using string lines,
- systematically search each grid quadrant for evidence,
- search the grave surface and dug out edges for tool mark evidence of the shovel or other tool used to dig the grave,
- sieve, trowels, brushes, buckets, etc are to be used to search and locate evidence,

After examining the surface of the grave for any trace evidence carefully remove extraneous material to reveal the boundary of the actual grave,

Collect samples of earth, each of about 1 kg, for analysis of poisons from:

- the centre of the area of soil exposed after removal of the grass sods or other grave covering,
- the soil in direct contact with the body in the vicinity of the chest,
- the right and left sides of the body in the vicinity of the mid portion,
- immediately under the mid portion of the body in the vicinity of the buttocks,
- an area, preferably at least 30m distant from the grave,
- if water is present in the grave, at least 1 litre in a sealed plastic bottle.

During excavation record in detail the various layers and compositions of soil and vegetation which have become mixed or mottled with the soil stratification.

Soil should be removed in even layers, and no more than 10 to 15cm of soil from a quadrant at a time,

- the soil should be sieved through a one centimetre square mesh and then a standard flyscreen mesh,
- all items should be photographed and plotted in the field sketch in plan and elevation location,
- around the body the soil should be carefully removed and sieved to reveal the position in

which the deceased is lying,

. photograph the position of the deceased,

- the deceased may then be removed from the grave by placing it on a clean plastic body sheet and wrapping the deceased to prevent loss of any evidence during transit to the morgue,

- the soil below the body should be excavated to a depth where the Examiner is satisfied that the soil had not been disturbed during the digging of the grave.

Liaison

Liaison with Investigating Officers is vital to the successful investigation of homicide investigations. Where possible attend and organise debriefings and meetings with investigating police.

Provide full details (in writing) of all matters relating to duties carried out at the scene and subsequent examinations.

Typed copies of the homicide investigation form, precis sheets, lists of items collected etc should be provided.

2.8 Presentation of evidence

Refer *General investigations* and *Technical examinations* (depending on type of examination).

3.0 Exhumation

3.1 Safety precautions

These mainly relate to biological hazards (refer *Deaths*).

3.2 Initial attendance and liaison

Consult with:

- Senior Investigating Officer,
- Government Medical Officer,

and, if necessary,

- Coroner,

on arrangements (date and time) for the exhumation of the body, special considerations, exclusion of media, etc.

Refer Commissioner's Instruction No. 61.

3.3 Request for experts at scene

Dependent upon the circumstances, other experts (such as the Video Operations Unit) may be required at the scene.

3.4 Recording

Photographs should be taken at the grave site:

- grave before it is disturbed,
- exposed coffin and attached name plate,
- official witnesses at the exhumation,
- video should be taken of the exhumation.

3.5 Examination

In cases of suspected poisoning, samples of earth, each of about 1kg, should be taken for analysis from:

- the centre of the area of soil exposed after removal of the grass sods or other grave covering,
- the soil in direct contact with the coffin lid in the vicinity of the chest of the body,
- the right and left sides of the coffin in the vicinity of the mid portion of the body,
- immediately under the mid portion of the coffin in the vicinity of the buttocks,
- an area in the cemetery, preferably at least 30m distant from the grave,
- if water is present in the grave, at least 1 litre in a sealed plastic bottle.

Rotted coffin

The coffin should be removed and taken to the morgue before collecting specimens. The Government Medical Officer should supervise removal of the deceased and specimens should be taken at that time.

All examinations are to be conducted at the Glebe or Westmead mortuary by a Government Medical Officer.

The Senior Investigating Officer should accompany the coffin to the morgue to prevent any unauthorised interference.

Post mortem

The Examiner should attend the post mortem and be present at the opening of the coffin.

Photographs should be taken:

- intact coffin,
- coffin as it is opened,
- body when the casket is opened,
- close up photographs of the body including any extraordinary preserved area following advice from the Government Medical Officer,

- identification evidence including: location of teeth, scars or other marks,
- items of clothing or jewellery or unusual objects,
- official witnesses at the post mortem.

3.6 Packaging and labelling

Any exhibits required for identification or analysis should be collected by the Crime Scene Examiner, including:

- name plate,
- post mortem samples collected by the Government Medical Officer,

and samples collected at post mortem, including:

- samples of wood from:
  - bottom of the coffin beneath the buttocks,
  - the top of the coffin, the lid from the top of the sides,
- the shroud or linen lining of the coffin,
- the packing from the sides and bottom of the coffin,
- any clothing.

The burial of the exhumed deceased is the responsibility of the Senior Investigating Officer.

3.7 Continuing liaison

The Senior Investigating Officer should be provided with a copy of any photographs and video and results of scientific analyses.

Property related incidents

4.0 Break and enter

4.1 Safety precautions

If oxy-acetylene cutting methods have been used to gain entry to premises or safes, adopt the safety procedures for handling bottles and equipment as outlined in *Technical examinations - vehicle identification - heat treatment.*

Examine broken glass and other sharp fragments with caution. Always wear protective gloves.

If human tissue, blood or other body fluids are present adopt the safety procedures as outlined in *Biological hazards*.

4.2 Initial attendance and liaison

- liaise with Senior Investigating Officer regarding the nature of the break and enter, if suspects have been identified or arrested,
- consider if fingerprint evidence may be present and notify the Fingerprint Section,
- establish points of entry and exit with Senior Investigating Officer,
- establish with the occupier of the premises (and Senior Investigating Officer) the movements of suspects inside the premises and the various areas ransacked, i.e. interior doors and cupboards which may have been forced,
- identify items foreign to the scene as identified by the occupier,
- identify items which have been moved by the suspects as identified by the occupier,

4.3 Recording

Photography

Photograph the scene as specified in *General investigations*.

Shoe, tyre, jemmy marks should be photographed as outlined in *Technical examinations*.

Photograph the scene so as to show all areas where suspect appears to have forced entry and ransacked the premises.

Show external views of premises, mid range and close up photographs of points of entry.

Note taking

Complete the 'Report on examination scene of break and enter' form,

Take detailed notes of layout of premises and physical evidence left at scene.

Plans

Always prepare a sketch plan and the relevant features of the scene. Measurements should be taken to produce a CAD plan, if required.

4.4 Examination

Examine the point of entry/exit for trace evidence including fibres, hairs, jemmy marks, etc.,

Determine and test how locks on doors/windows were forced open,

- establish direction of forcing and the implements that may have been used,
- record the brands and types of locks used and how secured,

If the break and enter involves no visible signs of forced entry consider that locks can be examined by locksmith experts to determine if the lock was picked or a key was used (refer *Laboratories and experts - experts index*),

Examine foreign items left behind, such as tools or other instruments and examine for trace evidence,

Examine scene for shoe/tyre prints,

Where entry was gained by breaking glass, carefully examine broken pieces for trace evidence,

Where jemmy marks in wood are discovered, a cast should be taken of the marks and filed for future reference (Refer *Technical examinations - comparisons - jemmy marks*).

Tool marks in metal should also be cast and filed but where possible the metal frame itself should be removed for examination purposes under the comparison microscope, (Refer *Technical examinations - comparisons - jemmy marks*)

Safe breaking

If the break and enter also involves a safe breaking, the following procedures should be followed:

- where safe packing has been removed or exposed, collect samples,
- if by explosion collect timing devices, wiring, detonators and other debris from the scene for possible identification,
- record in detail cutting marks and whether oxy-acetylene or drilling equipment was used. Collect samples of metal for comparison,
- where the offender is arrested collect clothing and make examinations for the relevant trace evidence (Refer *Technical examinations - fibres, biological,* etc.

4.5 Continuing liaison

Supply investigating police with brief details of technical evidence collected at the scene such as:

- copy of 'Report on examination scene of break and enter' form,
- type of shoe/tyre prints, possible brand and size,
- jemmy marks width and possible type,
- types of fibres recovered,
- whether blood was discovered, and later, when analysed, the blood groupings obtained,
- technical details regarding the safe breaking,

- technical details about the methods of forced entry,
- any other information which may assist in describing the modus operandi or otherwise linking suspects to the scene.

4.8 Presentation of evidence

Refer General Investigations, Technical Examinations (depending on type of examination)

5.0 Drug - clandestine laboratory

Clandestine drug laboratories is a term used to describe the illicit manufacture of drugs. These illicit operations involve peculiar occupational health and safety issues which requires careful assessment and training.

Task Force #4 of the Drug Enforcement Agency is responsible for the supervising, coordinating and facilitating the clean-up of clandestine drug laboratories in cooperation with law enforcement personnel and involved agencies. The Task Force is establishing policy and procedures for performing this role which will include the Physical Evidence Section.

Physical Evidence Section personnel will receive specific training in these duties. At present the following procedures should be adopted:

5.1 Safety precautions

- extreme caution should be used if a clandestine laboratory is discovered, the first Officers at the scene should be instructed to:

  . be mindful of bobby traps,

  . cordon the entire area off,

  . avoid breathing any fumes that are being emitted.

- laboratories can be bobby trapped and set within the external and internal perimeters of the laboratory. It may be necessary to contact the Ballistics Unit if such traps are discovered.

- on being requested to attend the scene the Examiner should establish whether Task Force #4 has been notified. If not make immediate arrangements either directly or via the Duty Operations Inspector (if outside normal office hours).

- wait for the attendance or instructions from Task Force #4. If the laboratory is still operating there is extreme danger and a forensic chemist will be required to attend the scene and stop the process.

5.2 Initial attendance and liaison

After attendance by the Forensic Chemist, the Examiners should liaise with the members of Task Force #4 to establish if:

- the premises are safe to enter,
- if any protective clothing is required,
- any specific recording or types of physical evidence are present and require processing.

5.3 Packaging and labelling

Any equipment or facilities used to process the illicit drugs should be collected by the chemist.

5.4 Standard procedures

Once the scene is rendered safe by the chemist the scene should be processed as per *General investigations*.

6.0 Drug - plantation

Drug plantations fall into three basic categories including:

- outdoor,
- indoor,
- hydroponic.

6.1 Safety precautions

Liaise with First Officers at scene. Plantations may often have booby traps to deter and or prevent detection. Traps can include:

- trip wires causing activation of explosive devices and firearms,
- traps of various types, including concealed spikes and pits,
- animal traps, such as rabbit etc,
    - . smoke flares, (warning devices for offenders)
    - . improvised explosive devices, connected to trip wires (these items might be strategically placed, not necessarily on pathways).

6.2 Initial attendance and liaison

Liaise with Senior Investigating Officer and discuss and plan strategies based on intelligence gathered, particularly with regard to the possibility of safety hazards already outlined.

6.3 Request for experts at the scene

Consider the use of agrononmist, fingerprint, video, etc.

6.4 Recording

Photography - consider video recording the extent and nature of the scene.

Sketch plans, showing layout of plants, watering systems, tools located and other equipment, e.g. fertiliser, tape , twine, water pump and drying areas, wire netting for fencing.

6.5 Examination

- determine size and extent of the scene,
- locate and record twine, stakes, fertiliser used on plants,
- collect samples of soil to determine if fertilised,
- collect samples of plants as exhibits and for possible comparison purposes,
- record soil dampness (when last watered),
- record the extent of cultivation of the area,
- consider fingerprint evidence,
- search for any irrigation equipment identifying marks, serial numbers or tags, for tracing,

6.6 Packaging and labelling

Package and label all items collected in accordance with procedures in *General investigations*.

6.7 Continuing liaison

Follow guidelines in *General investigations*.

6.8 Presentation of evidence

Follow guidelines in *General investigations.*

7.0 Fire - buildings

Fires are investigated under the provisions of the Coroners Act of 1980 and the Crimes Act of 1900.

Under Section 15 of the Coroners Act, a Coroner has the jurisdiction and duty to hold an Inquiry concerning a fire where the Coroner is informed by any member of the Police Service that a fire has destroyed or damaged any property within the State.

The Coroner is not limited by the provisions Justices Act of 1902. Hearsay and opinion evidence is not only admissible but often required for the inquiry.

If a suspect is arrested and charged with a criminal offence under the Crimes Act, 1900 hearsay evidence cannot be presented and expert evidence can only be presented under the normal rules of evidence as established by case law and the Justice Act 1902.

7.1 Safety precautions

Fire scenes are one of the most hazardous types of scenes to examine. At the scene the following safety precautions must be taken:

Major hazards

Where possible liaise with first Officers in attendance (both Police and Fire Brigade), the Chief Fire Officer, owner and occupier, to determine:

- general structural condition of premises,
- condition of floors, stairs, walls and especially roof and ceiling,
- presence of unusual, unstable or dangerous chemicals which may be inhaled or absorbed through the skin,
- if there are any HAZCHEM warnings relating to material on the site,
- whether electricity and gas have been isolated or disconnected by the relevant authorities. Liaise with Fire Brigade,
- if a plan indicating the location of items can be obtained prior to commencing examinations.

Extreme caution must be taken with industrial and commercial premises where the identity of chemicals and equipment is unknown.

Analyse the dangers and liaise with Chief Fire Officers on the results of inquiries.

- paths of access and egress used by Fire Brigade Officers,
- hazardous areas within the scene identified by the Fire Brigade.

The Fire Brigade has the initial responsibility for the scene and clearance must be obtained from the Chief Fire Officer for entry and examination by Police. Generally, the Chief Fire Officer must be satisfied that the fire is extinguished and that the air within the building is safe to breath. (Refer Section 25 of the Fire Brigades Act 1989 No.192)

Dangerous scenes

If the fire scene is too dangerous to enter or examine the reasons must be documented:

- include remarks made by the Chief Fire Officer or other qualified person/s,
- determine if the building can be made safe and if examination is feasible at a later time.

Fire extinguished

When the Chief Fire Officer of the Fire Brigade is satisfied that the scene can be handed over to Police, scene protection procedures should be initiated (refer Circular 91/103) and examination commenced.

Legal requirements

Once the premises have been declared safe by the Chief Fire Officer, Police have no general power to prevent the owner or occupier from entering the premises. Police become trespassers should the owner or occupier insist that Police leave. In these circumstances Police can obtain a search warrant under the Crimes Act, or under an order authorising entry under Section 25 of the Coroners Act to:

- remain on the premises to continue their investigation,
- take possession of any article which might be of assistance in determining the cause of the fire.

Protective clothing

Crime Scene Examiners must wear protective clothing as issued: helmet, overalls, gloves and boots before entering the

fire scene. Others persons who may enter the scene should be advised of potential danger.

Examination hazards

If the scene has been determined to be safe then the following precautions should be taken during examination:

- physically examine all floors and stairs that are to be used during the examination to determine if they are safe:
  - where possible examine from underneath,
  - in particular, assess the condition of damaged hand rails and individual steps,
- do not walk or use areas where the extent of fire damage cannot be determined and be extremely cautious of areas covered in fire debris,
- do not walk under or near extensively damaged roof structures or walls,
- be cautious of nails, glass and other sharp objects which may hidden in debris,
- if objects or debris are to be handled, protective leather gloves must be worn.
- never examine a fire scene by yourself, ensure that another Crime Scene Examiner or other Police are present in case of accident.

7.2 Initial attendance and liaison

Fire Brigade and first Police

In cases of suspicious or incendiary fires the Fire Brigade are required to notify Police.

Establish from Fire Brigade and first Police Officers at the scene the state of the fire on their arrival, specifically:

- exact time of alarm,
- wind direction,
- direction of fire spread,
- speed of fire spread, (natural or unnatural)

- any signs of immediate re-ignition or unusual fire movement whilst extinguishing fire.
- where the fire was burning,
- range and extent of fire damage,
- area of most intense fire burning,
- colour of smoke,
- their opinion as to the cause and origin of the fire,
- any incendiary devices, trailers or other suspicious circumstances observed whilst fighting the fire.

Establish from the Fire Brigade:

- location of forced entry made by the Brigade,
- other signs of forced entry (refer *Break and enter*),
- whether doors and windows were closed or opened by Brigade,
- method used to fight the fire,
- details of any salvage operations and where items were moved,
- any objects placed to impede access of Fire Brigade.
- objects placed over or in front of windows to impede view from the outside.

Examine and record all evidence of forced entry (refer *Break and enter*).

Suspicious Fire Incident Form

Obtain a copy of the "Suspicious Fire Incident Form" completed by the Senior Fire Brigade Officer who initially attended the scene.

Fire Investigation Unit

The Fire Investigation Unit of the NSW Fire Brigade is a small specialist unit of senior Fire Officers located at Five Dock (Sydney). The Unit will also attend country locations, if required.

The Unit's responsibilities are in accordance with the Fire Brigade's role of preventing fire and loss of life and confining and extinguishing fires.

The Unit attends serious property fires, where the cause is unknown or unusual circumstances are present. The Unit is notified through official Fire Brigade channels.

The Unit's role is to ensure the identification, preservation and security of evidence while the fire is being extinguished and immediately thereafter.

A primary objective of the Unit is to contribute to the reduction of the incidence or effect of fires by assisting the Fire Brigade operational officers and the Police in identifying the fire's cause and origin. Their role is entirely based on fire scene examination.

The Unit will assist Crime Scene Examiners with deployment of Fire Brigade Officers and equipment for removal of debris and general scene examination.

The Unit provides an important liaison role for the Crime Scene Examiner with the Fire Brigade, including:

- information, official records, statements and opinions from Fire Officers attending the scene,
- specific fire fighting techniques used at the scene,
- general Fire Brigade procedures and fire fighting techniques.

The Unit itself will provide Police with information, statements and opinions on suspicious fires as a result of their investigations.

Witnesses

Request that investigators and other police tell you of any witnesses observations of the fire. Conversation with other persons should be managed as outlined in *General investigations - conversation.*

Owners and occupiers

Establish from owners and occupiers, where possible:

- if flammable liquids were stored on the premises including type/s of container/s, quantity and exact location,
- general nature and position of combustible items,

- availability of scale or layout plan of the premises.
- security of the building, including locks and alarms, sprinkler systems etc.

Insurance agents and investigators

Often insurance agents and investigators will wish to liaise with Crime Scene Examiners regarding the results of examinations and/or become involved with the actual examination itself.

Liaison with insurance representatives can be useful to supply labour and machinery to remove debris at large fire scenes. This can greatly assist with the investigation.

Once the scene is handed over from the Fire Brigade to the Police an official investigation commences.

Any requests for information or examination of the scene should be referred to the Senior Investigating Officer.

Requests for photographs and other records should be processed by official request through the Commissioner's Office.

Media

Media will often attend large fire scenes and photograph or video record the scene whilst it is still burning. As those records may assist with fire cause and origin determinations, where applicable, request to view or obtain copies of the material.

7.3 Requests for experts at scene

Where applicable, experts such as gas and/or electrical supply inspectors should be called to attend the scene and assist with investigations. Consider the aspect of latent fingerprints being present at points of entry - exit, and on items found in and near the fire scene.

7.4 Recording

Photography

Coverage

Record the scene completely from all sides. Even undamaged areas provide evidence which can be used to formulate opinion evidence.

Exterior

Exterior photographs must record a good representation of all structures involved in the fire. Consider the use of aerial

photography through the Police Air Wing.

If called to the scene whilst the fire is still burning, take photographs to record and assist with later examination. Liaise with Investigators and First Police to ascertain if other persons or the media may have recorded events prior to your arrival and while the fire was still burning. Obtain copies of that material where applicable.

Interior

When photographing the interior of scenes, particular attention must be paid to making mid range and close up photographs of:

- possible points of entry forced (doors and windows) or otherwise into premises,
- alarm systems, sprinkler systems,
- items in unusual places, evidence of disturbance, piling of items for fire load, etc.,
- damaged and any undamaged areas immediately adjacent to indicate localised burning,
- possible ignition sources, including electrical and gas appliances and connections,
- objects and structures which depict fire spread, speed and heat,
- point/s of origin indicating:
  - the area/s where fire debris samples may have been collected,
  - excavation of debris revealing burn patterns, incendiary devices, fire trails, or other points of fire initiation,
- property and personal effects which you would normally expect to find in premises, e.g. photographs, clothing etc, (particularly in residential homes),
- ensure correct exposures in blackened areas,

Video

At large or complex fire scenes the Video Operations Unit may be called to attend and record the scene.

Note taking

Notes taken at fire scenes should be extensive and record in sufficient detail the facts which allow the formation of opinions regarding cause and origin determinations. Notes maybe written or tape recorded.

Copies of notes such as the Arson Form (P72A), precis sheet, plans and sketches should be forwarded to the Senior Investigating Officer as soon as possible.

Arson form

The N.S.W. Police Crime Scene Unit Report on Examination of Scene/Arson Fire Form (P72A) must be completed during the examination of fire scenes involving buildings.

A typed copy of this form must be forwarded to the Senior Investigating Officer.

Plans

Sketching

All arson scenes must be sketched to show location of:

- doors and windows, also record swing, type of door and type of locks, type of locks etc,
- flammable liquids,
- gas or electrical appliances and connections (if applicable),
- areas of localised or heavy burning,
- point of origin if found,
- where exhibits were collected from, (arson debris)
- furniture.

Plans

A sketch, CAD, or photogrammetry plan should be prepared for each fire scene. Regardless of the type of plan to be produced sufficient measurements should always be taken to produce a CAD plan if required. The original field sketch should always be retained.

7.5 Examination

The following sections outline the minimum procedures for fire investigation. However, this does not limit the Examiner from pursuing further technical considerations.

Technical terms, specific types of fires and related procedures are training aspects not included in this Manual.

Fire examination and determinations may be of a Coronial or criminal investigation nature. In the former, hearsay evidence is admissible and should be provided where possible to assist that Court.

Fire Origin Determination

Consider the facts gathered at the ***Initial attendance and liaison*** stage.

Adopt an objective view to determine possible causes or contributing factors, including:

- human error,
- natural cause,
- faulty equipment,
- animal,
- deliberate action.

Principal facts

Establish principal facts:

- determine speed of fire and spread,
- interpret burn patterns and characteristics,
- examine and record the condition of doors and windows including the condition of glass,
- consider overall damage in regards to known facts and normal fire behaviour (pyrolysis).

Attributing factors

Examine and record the building structure and areas of fire damage:

- consider the building material and construction to interpret fire damage (consistent or inconsistent with fire load?), appraise the external area of the building first,
- examine the areas of least damage towards the areas of most severe damage,

- areas where overhead damage is most intense (ceiling material and rafters),
- follow deepest charring and most severely damaged area of ceiling, wall covering and structural members,
- trace heat flow from ceiling/roof downwards to lower level areas,
- check lower level damage corresponds to overhead damage and determine if fire commenced at floor level,
- follow the deepest char and most severe destruction pattern to the lowest point and determine the area of origin,
- shelving, furniture, ledges, mouldings and all board edges to determine the direction of heat flow and fire spread (charring beneath these items may indicate a lower point of origin),
- lower structural sections of doors noting severe charring or destruction (damage at these points will constitute a low level burning fire - possible use of flammable liquids),
- floor construction and condition (level or uneven surface) and determine possible points of fire origin,
- burn patterns on floors for collection of flammable liquid residue (consider pooling in low areas) and objects which may be part of an incendiary device,
- where point of origin leads to floor level also consider underfloor areas for fire origin,
- burnt out areas to determine if fire originated from lower areas (regardless of the amount of severe destruction at upper levels),
- retrace the heat flow from ceilings and interior walls and floors noting the condition of metal, glass and plastics,
- type, pattern and depth of char at the probable point of origin,
- presence or absence of family pets,
- presence or absence of sentimental belongings.

Determine the general area of origin e.g. room with most severe damage. Where possible, determine the actual point of origin and formulate opinions based on the observed and recorded facts, as set out above.

Fire cause determination

The following must be examined, recorded and may be collected to establish cause:

- electrical appliances and wiring, (utilise relevant experts)
- gas plumbing and appliances, (utilise relevant experts)
- items which may be incendiary devices or containers of flammable liquids,
- samples of fire debris from the origin when the use of flammable liquids are suspected,
- other items which may indicate human error, natural cause, faulty equipment, animal or other cause.

Suspected arson using flammable liquids

If fire cause and origin determination is considered consistent with the use of flammable liquids:

- record and examine alligatoring to wooden surfaces at point of origin,
- record and examine low level surfaces at point of origin,
- clean back floor at suspected areas or points of origin, record and examine,
- examine and record joints and corners in wooden flooring,
- record and examine any other features consistent with the use of flammable liquids,
- examine and record downward burning in joists and bearers which may be consistent with the use of flammable liquids,
- consider the area below the actual construction, i.e. the floor. Where applicable examine the soil and collect samples for analysis. Dig 5 to 15 cm into the earth and smell for the odour of flammable liquids before

collection,

- check corners of rooms; few floors are level and flammable liquids will often run into and burn out corners. Whereas in a 'normal' fire these dead-air corners will be the least burnt,

- consider influencing factors such as conduction, convection, radiant heat, flashover and backdraft.

Examination of suspect

If flammable liquids are suspected as an accelerant:

- liaise with the Senior Investigating Officer to obtain the suspect's clothing (especially shoes),

- examine clothing as soon as practicable for the smell of flammable liquid,

- seal any items suspected of having flammable liquid in arson tins or cryovac plastic bags and convey to the laboratory.

Medical examination

If the suspect has suffered burns the Clinical Forensic Medicine Unit can examine and interpret the nature of the burns and present medical evidence at Court.

7.6 Packaging and labelling

General

Where flammable liquids are suspected of igniting the fire, consider absorbent material such as sawdust, cloth, carpet and furnishings. Collect samples from areas likely to hold residues of flammable liquid.

Concrete and brick

To collect samples for analysis from concrete or brick materials:

- place diatomaceous earth (pool filtering compound) on top of the concrete,

- leave compound for approximately 15 to 20 minutes to allow for absorption,

- sweep up the diatomaceous earth and place in an arson tin,

- supply a control sample of diatomaceous earth to the laboratory,
- alternately, samples of the brick or concrete could be collected. It should be noted however, that diatomaceous earth is the preferred method as it is an extremely absorbent material for flammable liquids.
- any fire debris or diatomaceous earth samples which are suspected of containing flammable liquids should be placed in either a cryovac barrier bag or a plastic bag within an arson tin.

Solid samples

All collected samples should, where possible be placed in a plastic bag and then sealed in arson tins. (the plastic bag prevents corrosion to the tin).

Cryovac plastic bags are also suitable but do not provide a virtually indefinite seal as do the tins. If samples may involve lengthy delays before delivery to the laboratory, the samples can be refrigerated in the plastic bag.

Cryovac bags and arson tins should have attached the red "For arson exhibits only" label.

Liquid samples

Liquid samples of suspected flammable substances should be collected in small glass bottles and sealed. Twenty (20)ml is sufficient.

Air sample

Where a strong smell of flammable liquid is present an air sample can be obtained for laboratory analysis. This method is to be used only as an adjunct to the collection of fire debris samples:

- use a bottle with a screw top similar to a large lemonade bottle,
- ensure that the bottle is clean,
- fill to the top with clean water,
- screw top on bottle,
- gather other samples for analysis,
- go to the area where it has been decided to take the air sample,
- turn the water filled bottle upside down,

- remove the screw cap and allow the water to drain away at the area concerned, keeping the bottle turned upside down,
- when the bottle is empty of water the air sample will be in the bottle,
- secure by replacing the screw cap on the bottle.

7.7 Continuing liaison

The Senior Investigating Officer should promptly be supplied with copies of all relevant information, (including Arson Form, precis sheet and plans), results of examinations by experts (gas/electricity supply inspectors, laboratory scientists).

7.8 Presentation of evidence

Statement

Qualifications of Examiner

The statement must begin with the qualifications of the Crime Scene Examiner in fire investigation, especially to support any opinion evidence being presented.

Formal qualifications

Include completion of external and NSW Police Service courses on fire investigation.

Experience

Years of experience related to crime scene duties on fire investigation and/or the approximate number of fires investigated. In particular the types of fire which is the subject of the statement.

Structure of building

- who spoken to or present at scene including time, date and conversations,
- type and construction of building describing number of storeys, walls, roof, ceiling, flooring, doors, windows, etc.,
- fire safety devices including alarm systems, sprinkler systems, fire doors, etc.
- security systems including burglar alarms, security grills on windows, doors, locks, etc.,

- description of electrical and gas outlets, connections and appliances related or not related to the fire cause and origin,
- contents of premises if relevant.

Forced entry

- condition of windows and doors including determinations regarding forced entry,

Fire load

- description of fire load (combustible materials) especially highly flammable materials including furniture, floor coverings, partitioning, insulation, etc. and cardboard, paper and flammable fluids,

Fire interpretation

- description of fire origin and physical features regarding interpretation of fire,
- weather conditions, wind, temperature extremes

Opinion

- a summary of the facts regarding the examination should be expressed in point form,
  - include the interpretation of burn patterns and general fire damage,
  - specific details regarding the established point of origin,
  - results of laboratory analysis,
  - results of any special tests conducted.

Presentation of exhibits

Plans Plans of the scene should accompany each fire statement.

Photographs Any evidence regarding description of physical features should be supported by photographs. Where there are a large number of photographs they should be placed in booklets with detachable binding.

Items Items collected, including those analysed at a laboratory, should be retained and made available for scrutiny by the Court. The Analyst's Certificate should also be included if available.

8.0 Fire - vehicle

Fires are investigated under the provisions of the Coroners Act of 1980 and the Crimes Act of 1900.

Under Section 15 of the Coroners Act, a Coroner has the jurisdiction and duty to hold an Inquiry concerning a fire where the Coroner is informed by any member of the Police Service that a fire has destroyed or damaged any property within the State.

The Coroner is not limited by the provisions Justices Act of 1902. Hearsay and opinion evidence is not only admissible but often required for the inquiry.

If a suspect is arrested and charged with a criminal offence under the Crimes Act, 1900 hearsay evidence cannot be presented and expert evidence can only be presented under the normal rules of evidence as established by case law and the Justice Act 1902.

8.1 Safety precautions

Materials, plastics and products used in the construction of modern motor vehicles, will produce dangerous gases when burnt and will linger in the vehicle for some time after the fire. These gases may cause headaches, respiratory problems and other related ailments.

- avoid spending lengthy periods of time inside the vehicle,
- examine in a well ventilated area, where possible,
- wear protective clothing as outlined in *Fire - buildings*,
- be cautions of glass and other sharp objects which may be hidden in debris.

8.2 Initial attendance

The Fire Brigade has the initial responsibility for the scene and clearance must be obtained from the Chief Fire Officer for entry and examination by Police. Generally, the Chief Fire Officer must be satisfied that the fire is extinguished and that the air within the vehicle is safe to breath. (Refer Section 25 of the Fire Brigades Act 1989 No.192)

Establish from Fire Brigade and First Officers (Police) at the scene, the state of the fire on their arrival, specifically:

- conditions under which the fire took place, eg whilst being driven or stationary etc,
- the position of the vehicle, particularly if parked in tall grassy areas as the heat from the exhaust system may ignite the grass under the vehicle by accident.
- exact time alarm raised,
- wind direction,
- direction of fire spread,
- speed of fire spread, (natural or unnatural)
- any signs of immediate re-ignition or unusual fire movement whilst extinguishing fire.
- where the fire was burning,
- range and extent of fire damage,
- area of most intense fire burning,
- colour of smoke,
- their opinion as to the cause and origin of the fire,
- any incendiary devices, trailers or other suspicious circumstances observed whilst fighting the fire,

Establish from the Fire Brigade:

- location of forced entry made by the Brigade,
- other signs of forced entry (refer *Break and enter*),
- whether doors and windows were closed or opened by Brigade,
- method used to fight the fire,
- details of any salvage operations and where items were moved,
- objects placed over or in front of windows to impede view from the outside.

Examine and record door and boot locks or holes in doors and boot for signs of forced damage or melting of lock parts. (The lock may have been removed when vehicle was stolen.) (refer ***Break and enter***).

Establish from the manufacturer whether the vehicle is covered by a manufacturer's fire hazard policy (for prevention and investigation vehicle fires).

If the fire appears to have occurred under normal operation, liaise with the Senior Investigating Officer, Vehicle Examination Unit, manufacturer and other experts regarding a mechanical examination of the vehicle.

Suspicious Fire Incident Form

Obtain a copy of the 'Suspicious fire incident form' completed by the Senior Fire Brigade Officer who initially attended the scene.

Liaise with Fire Investigation Unit Officers if in attendance as for *Fire - building*.

Witnesses

Request investigators and other police take steps to relate any witnesses observations of the fire to you. Conversation with other persons should be managed as outlined in *General investigations - conversation*.

Owners and occupiers

Ascertain if flammable liquids were stored in containers in the vehicle (including type of container, quantity and exact location).

General nature and position of any other combustible items.

Presence or absence of tools and accessories such as radio etc.

When examining the debris in the vehicle, take particular note as to whether there are any remains of car cleaning products in containers as some contain accelerant which could contribute to your findings.

Insurance agents and investigators

Often insurance agents and investigators will wish to liaise with Crime Scene Examiners regarding the results of examinations and/or become involved with the actual examination itself.

Once the scene is handed over from the Fire Brigade to the Police an official investigation commences.

Any requests for information or examination of the scene

should be referred to the Senior Investigating Officer.

Requests for photographs and other records should be processed by official request through the Commissioner's Office.

8.3 Recording and examination

Exterior

Photograph and take detailed notes of tyre marks and shoe prints or fire trails to the vehicle, if located up to and near the vehicle. (Refer ***Technical examinations - shoe and tyre***) (consider casts possibly second vehicle from the scene.)

Photograph the exterior and surroundings from all sides, (work from the outside in):

- ensure registration plates, if attached, are photographed,
- examine petrol cap (on or off),
- examine tyres and wheel nuts on vehicle, check correct wheels and number of wheel nuts,
- examine tyres on vehicle for condition and type of tyre (if tyres are badly damaged across top portion, obtain bottom portion to determine condition as the tyre tread will remain intact where it is contact with the ground),
- consider fingerprint evidence on items,
- photograph and collect any containers near the burnt out vehicle,
- collect any samples which may be evidence of the use of flammable liquids as outlined in *Fire - building,*
- take soil samples from under both sides of vehicle (if necessary dig 150mm or more to locate any accelerant, take samples on both sides as the fuel lines will run from the tank inside/near the driver's side of the vehicle and may have ruptured. Generally no petrol should be located under passengers side unless purposely added). The vehicle may have to be moved to do this examination.

Interior

Examine and photograph interior:

- determine if interior was stripped before fire,
- search for the ignition lock or melted portion on floor to determine if it was in place before or during fire. (If the key was in the ignition at the time of the fire, it may still be in the melted part of the lock in the debris on the drivers floor),
- determine if vehicle automatic or manual,
- determine if the hand brake is in the 'on' position,
- search vehicle, especially the boot, for personal items and spare wheel, tools, jack, accessories (a large quantity of items or specialised accessories are sometimes reported to be in vehicle prior to burning)
- determine position of windows by winder mechanism (up or down for air flow). If windows have been left open or partially open, the flames and heat will be vented therefore the fire may not reach the boot or engine compartment.

Engine compartment

Examine the engine and record details:

- whether motor was stripped or fire damage to motor parts, hoses or main parts,
- identify the vehicle,
- examine and photograph the engine bay area including identification plates, chassis, engine and any other serial numbers such as VIN (refer *Vehicle identification*),
- dig out the top layer of debris on floors in the vehicle,
- remove glass, etc and locate carpet if any, on the floors. (may assist in determining area of origin),
- note any odours such as petrol, kero etc., if strong enough take an air sample for analysis,
- collect debris from floor areas for analysis, floors will have inbuilt contours/channels where accelerant may collect,

- collect oil samples from the sump, gearbox and differential, examination (by the Division of Analytical Laboratories) may reveal the internal condition of the motor,

- determine the area of origin by eliminating areas of least damage and working towards areas of most damage (a fire from the engine compartment will not usually enter the cabin area).

For proecdures regarding Packaging and labelling of items, Continuing liasion and Presentation of evidence refer *Fire - building*.

9.0 Fire - bushfire

Fires are investigated under the provisions of the Coroners Act of 1980 and the Crimes Act of 1900.

Under Section 15 of the Coroners Act, a Coroner has the jurisdiction and duty to hold an Inquiry concerning a fire where the Coroner is informed by any member of the Police Service that a fire has destroyed or damaged any property within the State.

The Coroner is not limited by the provisions Justices Act of 1902. Hearsay and opinion evidence is not only admissible but often required for the inquiry.

If a suspect is arrested and charged with a criminal offence under the Crimes Act, 1900 hearsay evidence cannot be presented and expert evidence can only be presented under the normal rules of evidence as established by case law and the Justice Act 1902.

9.1 Safety precautions

Fire scenes are one of the most hazardous types of scenes to examine. At the scene the following safety precautions must be taken:

The Fire Brigade (and/or Bush Fire Brigade) has the initial responsibility for the scene and clearance must be obtained from the Chief Fire Officer for entry and examination by Police. Generally, the Chief Fire Officer must be satisfied that the fire is extinguished and that the air is safe to breath. (Refer Section 25 of the Fire Brigades Act 1989 No.192)

Fire extinguished

When the Fire Brigade is satisfied that the scene can be handed over to Police scene protection procedures initiated (refer Circular 91/103) and examination commenced.

Protective clothing

Crime Scene Examiners must wear protective clothing as issued: helmet, overalls, gloves and boots, before entering the fire scene. Others persons who may enter the scene should be advised of potential danger.

Examination hazards

If the scene has been determined to be safe then the following precautions should be taken during examination:

- the ground temperature may still be extremely hot, be cautious of where to walk,
- trees and other fauna may collapse and still be smouldering and extremely hot,
- if objects or debris are to be handled, protective gloves must be worn,
- never examine a fire scene by yourself, ensure that another Crime Scene Examiner or other Police are present in case of accident.

9.2 Initial attendance and liaison

Fire Brigade and first Police

In cases of suspicious or incendiary fires the Fire Brigade(and/or Bush Fire Brigade) are required to notify Police.

Establish from Fire Brigade and first Police Officers at the scene the state of the fire on their arrival, specifically:

- exact time of alarm,
- wind direction,
- direction of fire spread,
- speed of fire spread, (natural or unnatural)
- any signs of immediate re-ignition or unusual fire movement whilst extinguishing fire.
- where the fire was burning,
- range and extent of fire damage,
- area of most intense fire burning,
- colour of smoke,
- their opinion as to the cause and origin of the fire,
- any incendiary devices, trailers or other suspicious circumstances observed whilst fighting the fire,

Establish from the Fire Brigade (and/or Bush Fire Brigade) :

- method used to fight the fire,
- locate and protect the general point of origin if known. (This may be indicated by witnesses or fire brigade.)

Preserve the scene:

- seal off the area with crime scene tape,
- bush fire damaged evidence is extremely fragile. (It may mean the difference between confirmed arson or undetermined.)

Suspicious Fire Incident Form

Obtain a copy of the "Suspicious Fire Incident Form" completed by the Senior Fire Brigade Officer who initially attended the scene.

Fire Investigation Unit

The Fire Investigation Unit of the NSW Fire Brigade is a small specialist unit of senior Fire Officers located at Five Dock (Sydney). The Unit will also attend country locations, if required.

The Unit's responsibilities are in accordance with the Fire Brigade's role of preventing fire and loss of life, and confining and extinguishing fires.

The Unit attends serious property fires, fires where the cause is unknown or unusual circumstances. The Unit are notified through official Fire Brigade channels.

The Unit's role is to ensure the identification, preservation and security of evidence while the fire is being extinguished and immediately thereafter.

A primary objective of the Unit is to contribute to the reduction of the incidence or effect of fires by assisting the Fire Brigade operational officers and the Police in identifying the fire's cause and origin. Their role is entirely based on fire scene examination.

The Unit will assist Crime Scene Examiners with deployment of Fire Brigade Officers and equipment for removal of debris and general scene examination.

The Unit provides an important liaison role for the Crime Scene Examiner with the Fire Brigade:

- information, official records, statements and opinions from Fire Officers attending the scene,
- specific fire fighting techniques used at the scene,
- general Fire Brigade procedures and fire fighting techniques.

The Unit itself will provide Police with information, statements and opinions on suspicious fires as a result of their investigations.

Witnesses

Request investigators and other police take steps to relate any witnesses observations of the fire to you. Conversation with other persons should be managed as outlined in *General investigations - conversation*.

Insurance agents and investigators

Often insurance agents and investigators will wish to liaise with Crime Scene Examiners regarding the results of examinations and/or become involved with the actual examination itself.

Once the scene is handed over from the Fire Brigade to the Police an official investigation commences.

Any requests for information or examination of the scene should be referred to the Senior Investigating Officer.

Requests for photographs and other records should be processed by official request through the Commissioner's Office.

Media

Media will often attend large fire scenes and photograph or video record the scene whilst it is still burning. As those records may assist with fire cause and origin determinations, where applicable, request to view or obtain copies of the material.

Special equipment

Flags, scene tape or rope (available in large quantities, if required).

Straight edge to focus on small areas whilst conducting the examination and search of the area of orign.

Steel tape and compass to orientate sketches and enable

transcription onto a topographical map.

Magnet (50lbs capacity or more) to recover metallic particles, such as brake shoe or exhaust fragments, which may have started a fire near a road.

9.3 Recording

Photography

Coverage

Record the scene from all directions. Even undamaged areas provide evidence which can be used to formulate opinion evidence.

Photographs must record a good representation of all areas involved in the fire. Consider the use of aerial photography through the Police Air Wing.

If called to the scene whilst the fire is still burning, take photographs to record and assist with later examination. Liaise with Investigators and First Police to ascertain if other persons or the media may have taken photographs prior to your arrival and while the fire was still burning. Obtain copies of those photographs where possible.

- point/s of origin indicating:
  - the area/s where fire debris samples may have been collected,
  - excavation of debris revealing burn patterns, incendiary devices, fire trails, or other points of fire initiation,
  - property and personal effects
- ensure correct exposures in blackened areas,

Video

At large or complex fire scenes the Video Operations Unit may be called to attend and record the scene.

Note taking

Notes taken at fire scenes should be extensive and record in sufficient detail the facts which allow the formation of opinions regarding cause and origin determinations. Notes maybe written or tape recorded.

Copies of notes and the precis sheet, plans and sketches should be forwarded to the Senior Investigating Officer as soon as possible.

Plans

Sketching

All bush fire scenes should be sketched to show location of:

- flammable liquids,
- areas of localised or heavy burning,
- point of origin if found,
- where exhibits were collected from, (arson debris)

Plans

A sketch, scale, CAD or photogrammetry plan should be prepared of the fire scene. With bushfires a plan of the area of orign will be required together with a topographical map. Maps can be obtained through the Mapping Unit. The original field sketch should always be retained.

9.4 Examination

The following sections outline the minimum procedures for bush fire investigation. However, this does not limit the Examiner from pursuing further technical considerations.

Technical terms, specific types of fires and related procedures are training aspects not included in this Manual.

Fire examination and determinations may be a Coronial or criminal investigation. In the former hearsay evidence is admissible and should be provided where possible to assist that Court.

Fire Origin Determination

Consider the facts gathered at the *Initial attendance and liaison* stage.

Adopt an objective view to possible causes or contributing factors, including:

- human error,
- natural cause,
- faulty equipment,

- animal,
- deliberate action.

Principal facts

Establish principal facts:

- determine speed of fire and spread,
- interpret burn patterns and characteristics,
- consider overall damage in regards to known facts and normal fire behaviour (pyrolysis).

Attributing factors

If a building is involved in the bushfire it may be necessary to adopt the procedures outlined in *Fire - buildings.* Record the building structure and areas of fire damage as it relates to the bushfire:

- liaise with the Fire Brigade and First Officers regarding the involvement of the building with regard to the bush fire,
- appraise the external area of the building first, consider the building material and construction to interpret fire damage (consistent or inconsistent with fire load and the progress of the bushfire),
- determine if the building may have been the point of origin for the bushfire,

Fire origin determination

The area of origin may be indicated on arrival. Flag/tape/rope off this area as soon as possible.

Consider the characteristics in which bushfires burn and progress. During examination determine the following:

- 'Head' and 'Backing' burn patterns.
- the weather, fuel and topography,
- burn patterns leading to the area of origin,
- the direction of the fire and backtrack until all burn patterns come together in one location,
- the area of origin is known as the area of confusion,

- if all indicators are followed, they should lead back to one or more 'Area/s of confusion' depending on how many fires were started,

- if some tall unburnt grasses are located in the centre of this area, it may indicate that a cigarette lighter, or similar, was used to start the fire towards the top of the grasses:

  . it is likely that no sources of ignition will be located during the search of the area of origin,

  . a search of the area should still be conducted to confirm this finding.

Other factors should be considered including:

- wind will probably be the greatest effect of all the elements on spread and intensity:

  . fire moving with the wind, the "Header", burns faster than the fire 'Backing' into the wind,

  . fires will create their own wind, drawing the air into itself and will normally 'spot' in the direction the wind is blowing, fires out breaking in directions opposite to the wind should be examined carefully,

- slope will be the next factor of importance for rate of spread. Fire will burn faster uphill because of the preheating of the uphill fuels.

- fuels will aid a fire to burn faster and burn more completely when drier. High humidity or moisture filled fuels will burn more slowly and leave more unburnt material.

- barriers can cause a fire to slow down, go out or cause wind eddies to temporarily change direction of the fire.

- access routes to area.

Indicators of fire direction

Grass stems, determine, interpret and record:

- when approached by a fire, one side is heated, weakened or burnt,

- grass stems or clumps of grass stems will fall towards

the weakened side, pointing towards the direction from which the fire came,

- as with all indicators, distinguish the direction from several different sources, as wind or time may affect the direction in which the stems fall.

Protected fuel indicators, determine and record:

- a slow burning low heat fire will only burn the approach side of vegetation,
- this may leave the vegetation on the departure side of the fire unburnt or only blackened,
- any item lying in the path of the fire ie. a log, protecting fuel underneath, will leave a definite burn pattern, which will indicate the direction of the fire,
- the protected area is very distinct, there will be a clean burn line on the front side (approach) and a ragged burn line on the departure side of the object,

Cupping indicators, determine and record:

- cupping normally occurs on the windward side of a stub of timber, brush or grass,
- this is the side exposed to the most wind and should be expected to burn the deepest, while the opposite side remains cooler and protected it will burn off at an angle.
  - this effect will take place even in grasses and can be examined closely by rubbing the back of the wrist over burned grass,
  - when rubbing in the direction the fire burned, there will be a velvety feeling but while rubbing in the opposite direction, there will be a pricking sensation on the wrist,
  - the wrist should be moved in all directions until the most velvety and most resistant directions are found.

Char pattern indicators, determine and record:

- a fire burning uphill or with the wind creates a type of char pattern which burns trees and bushes at a steep angle,

- the angle will be higher on the departure side of the fire than that of the approach side and is caused by a vacuum on the back side (departure side) of the tree which draws the flames into an eddy on that side,

- the flames are then drawn up the tree by the heat movement. An accumulation of fuel on the windward (approach) side will have little effect on the char pattern.

- a fire backing down the slope or against the wind will create the type of char pattern that is even or parallel to the ground slope, regardless of angle of slope,

- a backing fire will show consistency of height,

- a fire starting amongst trees and spreading outward will create a 'V' pattern if not affected by wind,

- a fire affected by wind moving through trees will start off cooler and heat up consuming fuels above it,

    . the bush or trees at the point of origin will have the crown more or less in tact.

Alligatoring, determine and record:

- usually found on fence posts, boards, structures and signposts,

- the side with the deepest charring indicates the direction of the fire.

Freezing of branches, determine and record:

- when leaves and small stems are heated they tend to become soft and easily blown by the prevailing wind created by the fire,

    . which often remain pointed in the same direction as they cool after the fire passes. (the direction the fire was going.)

    . it is necessary to check several indicators to determine the fire direction.

Staining, determine and record:

- rocks and other non combustible objects exposed to fire will be stained by minute particles and vaporised fuels carried by the fire,

- staining will be on the approach side of the object,
  - . the departure side, will be cleaner,
  - . on wire fences, soot will be deposited on the approach side of the fire,
  - . when checking fences, more soot will be deposited on the wire lower down.

Searching the origin

When determined, search the area of origin:

- carry out the search on hands and knees as the source of ignition will often be very small,
- divide area into lanes with string line, (length or width ways over the area of origin) about 12" to 24" wide.
- search each lane for signs of a source of ignition,
- if ash covers various portions of the lane, blow it away as it may cover a match or book of matches,
- use the straight edge to focus on small objects,
- it is advisable to have more than one search of the same area before moving onto the next lane,
- it is also advisable to have a second person carry out the same search on the same area.
- a magnet may be used in this search to retrieve particles of brake shoes, (eg.near railway lines), or possibly the staple from the book of matches.
- if a source of ignition is located, eg. a can with a small amount of petrol, rags, matches, which may be extremely fragile:
  - . record thoroughly,
  - . consider fingerprint evidence before collecting (refer *General investigations*).
  - . photographic glue spray/hair spray may be used in an attempt to hold the items in one piece prior to being removed,

Fire ignition sources

If an incendiary device is not located determine other ignition sources:

- lightning

  These strikes can be determined through indicators such as, strike marks or splintered poles or trees, fused sand or soil in glass like clumps at the area of strike. Determine if there were any recent electrical storms, remoteness and improbability of human activity in the area.

- Spontaneous combustion

  The ignition of a substance with no external heat source. Compounds such as oil or grease are triggered by a chemical reaction. Vegetable matter, such as hay, grain, sawdust, are started by decomposing and bacterial action. Determine if this phenomenon may be the ignition source.

- Fires caused by humans (accidental)

  These include sparks and embers escaping from:

  . burning buildings,

  . burning dumps,

  . burning vehicles,

  . camp fires,

  . land management practices,

  . signal fires.

  The following may not be as obvious:

  . blasting,

  . equipment use or breakdown,

  . cutting or welding,

  . fireworks.

10.0 Mining incidents

The investigation of mining incidents is covered under the provisions of:

- Commissioner's Instructions 62.15 (refers to investigation of fatalities),
- Mines Inspection Act No. 75 of 1901,
- Coal Mines Regulations Act of 1982 (defines mines to include quarries, dredges and other places referred to in the Act).

10.1 Safety precautions

The mining environment is inherently dangerous. Before entering the mine:

- report to and liaise with:
  - Registered Mine Manager,
  - Safety Superintendent of the Mine,
  - District Inspector of Mines,
  - District Inspector of Collieries (coal and shale mines),
  - determine if the mine is safe to enter,

and if so,

- what safety precautions to follow, and
- whether equipment and other items to be carried will be safe to use in the mine.

10.2 Initial attendance and liaison

Determine the circumstances of the incident, any special requirements and assistance from:

- Senior Investigating Officer,
- Coroner,
- Inspector of Mines/Collieries, Mine Manager or Safety Superintendent,

Before entry to mine, plan and recheck:

- equipment needs (it may not be possible to return for additional needs),
- practicability and safety of all equipment to be used by seeking approval from the person in authority.

10.3 Request for experts at the scene

Before entry determine the need for, and arrange, any Physical Evidence specialist Unit support services (eg. Photogrammetry, Video Operations Unit, if possible), rescue services, etc.

Assistance may be arranged through the District Inspector of Mines/Collieries for mining engineers, mechanical engineers, electrical engineers, rock mechanic specialists, mines rescue, etc.

Liaise with Senior Investigating Officer about informing the Coroner who may desire to personally attend the scene.

10.4 Recording

Photography

Strobe light

Underground photography in a mine is usually done under adverse conditions. Electronic Flash units and cameras fitted with batteries are generally not permitted in the mine without special approval by the District Inspector, unless flame proofed. A flame proofed strobe light can be obtained from either the District Inspector or the Mine Manager. To take photographs in a mine with standard camera equipment, the following procedures can be followed:-

Mechanical camera

If possible take a fully mechanical camera,e.g. Rollei SL66. Set the camera on the 'B' setting. (Removal of the batteries from an electronic camera will not suffice. It cannot be used on the B setting).

Mount the camera on a tri-pod (aluminium tripod may breach mine safety procedures) and face it towards the scene to be photographed.

Paint in scene

Lock the camera on the B setting. Using the strobe light paint the scene by flashing it until the entire scene has been lit. Each time the strobe is activated, the resultant area that is illuminated should overlap the area previously illuminated. If a strobe lamp is not available the same procedure should be adopted, using a number of cap lamps instead of the strobe light. Take photograph in both black and white, and colour.

Prior to going under ground, take a series of photographs of which include:

- approach to the mine,
- exit of the mine,
- approach and exit to the scene,
- scene,
- any equipment involved.

Plans

Before entry to the mine, obtain (where available) a plan from the Inspector of Mines/Collieries.

Where appropriate request a scale plan be prepared via the District Inspector, who will suitably instruct mine surveyors.

At the scene draw a field sketch and include all measurements of relevant features (it may not be possible to return at a later date).

Note taking

Record in detail:

- manner and means of access to the scene from the surface,

- environmental aspects of the scene - temperature, dust level, any flooding, lighting type and level, air quality, ventilation, etc.,
- any physical aspects related to the incident,

Determine from the Inspector of Mines or independent mining engineer the:

- working of the mine,
- specific details of the workings in and around the scene and record these details.

10.5 Examination

Where equipment which cannot be removed from the scene requires examination, liaise with the Inspector of Mines or the Coroner for an order. The District Inspector will normally order that equipment be examined as a matter of course.

Review

Before leaving the scene, review all aspects of recording and examination. Returning to the scene may not be possible or practical.

Check that all equipment used in the mine is on hand and return any borrowed items before leaving.

10.6 Packaging and labelling

Be guided by advice from the Inspector of Mines for the method of collection of items (air samples, rock samples, equipment, etc.).

10.7 Continuing liaison

Where appropriate expert analysis is available from the Department of Mineral Resources. Follow procedures for obtaining outside expert assistance (refer *Laboratories and experts*).

Liaise with the Senior Investigating Officer and the Coroner about findings, further examinations to be performed, expert assistance to be sought, etc. Provide a tentative date for providing a completed brief.

Report to Minister

The District Inspector of Mines/Collieries is required to report to the appropriate Minister under section 39 of the Mines

Inspection Act No. 75 of 1901. Liaise with this Inspector during the investigation.

10.8 Presentation of evidence

Statements Avoid, where possible technical terminology. If necessary to include such terms, then explain their meaning.

11.0 Vehicle collision

Crime Scene Examiners are required to attend:

- serious vehicle collisions, and
- hit and run collisions.

11.1 Safety precautions

- danger from traffic,
  - . wear 'Police' reflective vest at scene
  - . ensure scene is adequately controlled for traffic diversion by uniform police,
- with spilt fuel, and/or other chemicals, liaise with Fire Brigade and First Officers re safety,
- avoid contact with jagged metal from wreckage, use gloves if necessary, to examine,
- take the necessary precautions to avoid unsafe handling of blood and other body fluids (refer *Biological hazards*)

11.2 Initial attendance and liaison

Upon receiving call request that First Officers at the scene attend to scene protection responsibilities (refer *General investigations*).

Attend as promptly as possible, physical evidence may be easily lost or destroyed at vehicle collisions.

Upon attendance consider, weather conditions and the necessity to preserve evidence.

Control the scene:

In order to record and examine the scene, request uniform police to:

- divert or stop the traffic,

- barricade pedestrian traffic flow,
- move unrelated vehicles, eg Fire Brigade, tow trucks, to record the scene as it was at the time of collision,

Liaise with First Officers and Senior Investigating Officer regarding:

- the nature of injuries to those involved in the collision,
- the facts surrounding the collision,
- extent and boundaries of the collision scene,
- witnesses' versions of events.

11.3 Request for experts at the scene

Depending upon the circumstances the Examiner should consider requesting the attendance of:

- Photogrammetry Unit, including collision reconstruction personnel,
- Vehicle Examination Unit, particularly in multiple deaths and or bus crashes,
- Police Rescue Squad to provide lighting at night scenes,
- Fingerprint Section.

11.4 Recording

Photography

Consider special photographic requirements for collision reconstruction purposes.

Photograph:

- general locating views of the roadway, in a north, south, east, west, format.

- any peculiarities in the roadway including pot holes, bends, painted lines, signs or any other information relating to the:

  . area of collision,

  . or area immediately prior to the area of collision.

- the vehicles in position

- the interior of vehicles to locate drugs or alcohol which may have been used,

- any other items, objects or matters relating to the condition of the vehicles which may have contributed to the collision including:

  . general condition, exterior and interior,

  . apparently faulty or defective mechanisms and items such as; steering wheel, pedals, gear levers, tyres, wheels, etc,

  . evidence of driver if unknown or disputed e.g., marks on pedals, clothing imprints or other trace evidence.

If the collision has occurred at night, photographs should show:

- all the light poles including:

  . location,

  . type,

  . whether they are on or off, note flickering or otherwise malfunctioning lights and record by photography if possible,

- daylight views (taken the next day) and any additional features which may not have been apparent at night.

Plans

Field sketch

- a field sketch, including measurements to produce a scale plan, should be taken at the scene of all motor vehicle collisions attended by the Crime Scene Examiner,

- all measurements should be taken by the Crime Scene Examiner,
- depending on the complexity of the scene the Crime Scene Examiner may;
  - . prepare a scale plan by hand measurement (if CAD system not available),
  - . forward the field sketch and measurements to the Photogrammetry Unit and request a CAD plan be produced,
  - . request the attendance of the Photogrammetry Unit at the scene to conduct a terrestrial photogrammetry survey, (where large sweeping or gradual bends are involved, gradients, vehicles in position, skid marks and other debris which would be time consuming and difficult to plot by hand measurements accurately)
- the following should be examined, recorded and measured in position:
  - . skid marks on the roadway,
  - . scuff marks,
  - . items of debris,
  - . damage to the roadway,
  - . vehicles in position,
  - . damage to vehicles.

Note taking

Notes should be taken to record all details of the scene and physical features including:

- . weather conditions,
- . damage to vehicles,
- . evidence which indicates the point of impact,
- . items collected,
- . visibility and lighting conditions,

- road surface,
- street lighting,
- amount of traffic upon attendance,
- items inside vehicles, such as alcohol, or other drugs,
- gradients and bends,
- general condition of road,

11.5 Examination

Point of impact

Determine, as close as possible, the point of impact. Relate road damage to vehicle damage by examining and recording:

- gouge marks to the roadway,
- vehicle damage including the underside for the adherence of bitumen or other material from the roadway,
- relate roadway damage and vehicle damage.

Relate damage on each vehicle to the other by examining and recording:

- extent of damage,
- transfer of paint,
- location of debris,

Headlight examination

- Do not turn on lights, consider the possibility of examination to determine whether the headlights were on or off (Refer *Technical examinations - headlight examination*).

Omnibus and heavy vehicle

In addition to the above procedures, tachograph cards (compulsory for all heavy vehicles registered in this State) should be obtained as soon as possible after the collision.

Information on the tachograph includes:

- engine revolutions,

- speed,
- time,
- distance travelled.

This information is used to reconstruct events leading up to the collision.

Collecting and interpreting tachograph cards refer to *Specialist Units - Vehicle Examination Unit*.

Hit and run collision

For hit and run collisions, the following procedures should be followed in addition to those outlined in the previous sections:

Location of evidence

Sources of physical evidence and exchange of material may be located:

- at the scene,
- on the offending vehicle,
- on the victim/s, including;
  - clothing,
  - and physical injuries,
- on any other object impacted at the scene.

Scene examination

A thorough and systematic search co-ordinated by the Crime Scene Examiner must be made at the scene to collect:

- all car parts and accessories,
- glass fragments on the roadway,
- all items of clothing, threads or fibres,
- biological samples including blood, hair and tissue,
- paint flakes,
- oil and grease,

- any other items which may connect the offending vehicle to the scene.

All items must be preserved as close as possible to their original condition.

Examine all items collected and consider their potential for different analyses:

- identify vehicle parts; liaise with the Vehicle Identification Unit, Vehicle Examination Unit, distributors and manufacturers,
- analysis of glass, paint, oil, grease and biological samples. (refer ***Laboratories and experts - glass and paint***),
- physical fit comparisons of items found at the scene, and/or on victim, compare with the offending vehicle (refer *Technical examinations - comparison, physical fit*).

Pedestrians

Liaise with First Officers and Senior Investigating Officer regarding:

- the nature of injuries to the pedestrian,
- the collection of the pedestrians clothing and other items, as soon as possible to avoid loss of evidence,
- if the pedestrian has been taken to hospital; make immediate arrangements to collect clothing, personal items, etc. for later examination, (refer *General investigations*):
  - clothing and items may be collected by the Crime Scene Examiner or other Police. Ensure to obtain the names of hospital staff who handed clothing and other items over,
  - where a blood transfusion has been given arrangements should be made with hospital staff to obtain a pre-transfusion blood sample,
  - arrange for the victim to be fingerprinted if necessary,

Deceased pedestrian

Where the victim is deceased:

- examination and recording may be performed at the morgue,
- body must be thoroughly examined for matching wounds,
- request GMO to collect biological samples including hair, blood and fingernail clippings,
- arrange for the deceased to be fingerprinted,

Examination of clothing

Clothing and items removed from the victim:

- which were packaged in the original bag (whether by the Crime Scene Examiner or hospital staff) should be placed on a clean examination table free from draft,
- a large sheet of brown paper should be placed on the table and the clothing should be removed from the bags carefully over the sheet of brown paper,
- record (photograph and take notes), examine and collect trace evidence such as paint, glass, metal oil and grease from clothing,
- after examination carefully shake bag, and the clothing over brown paper sheet and record, examine and collect any remaining trace evidence.

Offending vehicle

Record, examine and collect physical evidence from the offending vehicle including:

- damage to vehicle,
- recent panel repairs,
- any foreign biological material (hair, blood or tissue),
- fibres or clothing imprints,
- any other materials which may link the vehicle to the scene,
- collection of paint flakes:

- if large samples of paint flakes have been collected from the scene, photograph all areas of damage in detail and conduct physical comparison before collecting a sample for analysis, (refer *Technical examinations - comparisons*),

- for paint analysis collect samples from all areas of damage. Paint samples must include all layers down to the bare metal surface of the body.

- trace evidence should be considered on all areas of the vehicle including underneath, (if the victim has been run over)

- physical imprints of clothing, items of jewellery, shoes etc. which may have been impressed into the body work or glass surfaces of the vehicle, and may be compared (refer *Technical examinations - comparisons*)

- consider collecting grease and oil from the vehicle for comparison with grease and oil on victims clothing,

- property which was worn or carried by the victim may have broken or completely transferred onto the exterior or into the interior of the vehicle, e.g. jewellery, personal items, wallets, purses, etc.

- any identifiable features or items,

- arrange for the Fingerprint Section to examine the suspect' vehicle for:

  - suspect's fingerprints on the vehicle including; interior surfaces, door handle, etc.

  - fingerprints from a hit and run pedestrian may be on the bonnet, roof or windscreen of the vehicle,

Aircraft collisions

References include:

- NSW Police Emergency Manual,
- Civil Aviation Act and Regulations,
- Commissioner's Instruction 62.22 & 136.

Bureau of Air Safety Investigation, which is part of the Department Of Transport and Communications investigates all aircraft collisions and incidents including 'air miss' incidents.

Air craft collisions that involve a death of a person are investigated under the provisions of the Coroners Act of 1980 which involves the NSW Police and the Bureau of Air Safety Investigation. The State Coroner has jurisdiction when military aircraft collisions involve a death in New South Wales.

Safety precautions

Hazards include:

- location, which may be remote and inaccessible,
- deceased persons, body tissues and fluids,
- fuel, machinery, materials and buildings.

Location

- wear appropriate clothing for the weather conditions and prolonged examination of the scene,
- consider the temperature and climate extremes,
- consider provisions such as drinking water, hat, sun block, jacket, etc,
- additional protective clothing such as overalls, boots and leather gloves may be required.

Deceased persons

Deceased persons, blood and body tissue may be present. (Refer Biological hazards)

Fuel machinery, materials and buildings

Aircraft fuel usually forms the greatest danger to the Examiner. If the aircraft is, or has been, on fire liaise with the Chief Fire Officer on the scene to determine when it is safe to enter.

If the aircraft has not caught fire and there is no fire officer, arrange for the attendance of a fire unit. Modern aircraft structures include composite materials that, when burnt, may cause respiratory problems if inhaled.

Broken machinery and twisted metal structures of the damaged aircraft may have sharp edges. Use extreme caution when walking or handling items on, or around the wreckage.

Initial attendance and liaison

- Upon receiving the initial call immediately check whether investigating Police have complied with Commissioner's Instruction 62.22, ie:

  . immediately notification of the Coroner when an aircraft crash involves a fatality, and the Department of Transport (Bureau of Air Safety Investigation) of the incident. The Coroner directs where the post mortem examinations are to be performed.

  . immediately inform the Sergeant at the Coroners Court, Glebe by telephone when mass fatalities result from an aircraft or regular public transport collision. The Institute of Forensic Medicine, Sydney undertakes post mortem examinations and pathology services in these circumstances. The local area pathologist is not involved. Instigate Disaster victim identification procedures.

- determine the following information:

  . location of the accident, including directions to reach the scene,

  . brief description of the collision,

  . aircraft's last departure point and its destination,

  . number of people onboard the flight, ages, names and sex (obtain a passenger manifest from the operator if possible),

  . number of deceased persons,

- extent of injuries suffered by other persons,
- scene protection responsibilities with regard to the wreckage,
- inform investigating Police to comply with Air Navigation Regulations,

Air Navigation Regulation 275 provides that an aircraft involved in a collision shall be deemed to be in the custody of the Secretary of the Department of Transport and Communications and shall not be removed or otherwise interfered with without the permission of the Secretary, or other persons authorised by the Secretary (officers of Bureau Of Air Safety Investigtion), except as is necessary for:

- the extrication of persons, animals and mail from the wreckage,
- the protection of the wreckage from destruction by fire or other cause,
- the prevention of danger or removal of obstruction to air navigation, to other transport or to the public (removal of wreckage from roads and railway lines),
- the removal of the aircraft and its contents to a place of safety when the aircraft is wrecked on water,
- the removal of goods or baggage under the supervision of a Constable,
- goods or baggage should normally be left in place until the arrival of the Bureau Of Air Safety Investigtion investigator and if necessary protected by waterproof sheeting. Dangerous goods may have contributed to the collision. If it is imperative to remove goods and baggage, the position of all items, whether in or out of the aircraft, should be recorded (preferably photographed), then stored in the vicinity of the aircraft and protected under Police supervision until released by the Bureau Of Air Safety Investigtion investigator,
- in the case of the arrival of an aircraft (of any nationality) from outside Australia, further requirements are:
  - goods and baggage are not to be removed from the vicinity of the aircraft without the consent of an Officer of Customs,
  - on release by the Bureau Of Air Safety

Investigtion investigator, goods baggage and personal belongings will normally remain in Police custody until claimed by the owner or owner's agent,

- emergency locater transmitters should be switched off as soon as possible,

- aircraft batteries should be disconnected at an early stage to avoid possibility of fire,

- no further disturbance of the wreckage should be necessary or permitted. Where an comes into the custody of the Secretary the pilot or owner do not have the right to access without authorisation from the Bureau of Air Safety Investigtion investigating officer. However, where an aircraft owner's property is threatened with further damage following a collision, the owner or representative may have access under the supervision of a Police Officer sufficient to take the necessary precautions to prevent further damage.

- all wreckage and any marks made by the aircraft should be guarded or secured against unauthorised access until the Bureau of Air Safety Investigtion officer arrives, and assumes control of the investigation.

  Where Bureau Of Air Safety Investigtion officers are usually required to travel considerable distances to collision sites, Bureau Of Air Safety Investigtion approval is usually given for removal of bodies from the wreckage before the arrival of the Bureau of Air Safety Investigtion officers. The location of all bodies must be photographed before removal.

- appraise the situation and determine if any additional scene assistance is required. Adopt the procedures outlined in *Disaster Victim Identification*.

- at the scene liaise with investigating police and establish:

  . extent of the scene (confined or extensive),

  . circumstances prior to impact,

  . the actions taken by the First Officers at the scene regarding the removal of any bodies or survivors and their position,

  . establish if persons have contaminated or moved the deceased or other physical evidence

(including Ambulance, Fire Brigade and other Police, witnesses),

. ensure all relevant information is obtained from all persons who entered the scene, including:

. what was touched or moved. This is particularly important in relation to the positions of all switches and aircraft controls,

- liaise with fire officers who attended the scene and determine:

. if fuel pumps, switches or any other controls may have been switched off or otherwise rendered safe; establish which switches were changed, and their original position,

Note - the pilot in command of an aircraft sits on the left hand control seat. Some helicopters have the pilot in command seated in the right front seat.

Requests for experts at the scene

Bureau of Air Safety Investigations:

- Liaise with investigator from the Bureau of Air Safety Investigation, closest to the scene. (Central office, Canberra other offices located at Adelaide, Brisbane, Melbourne, Perth and Sydney. (Refer External Laboratories & Experts) The investigator should have been notified by police who initially attend the scene. In most instances the investigator will attend after emergency personnel have completed their duties.

Forensic Aviation Pathologist

- Notify the Institute of Forensic Medicine at Glebe, a forensic aviation pathologist may be available to attend the scene.

Photogrammetry Unit

- A photogrammetry survey is required of all aviation accidents which involve fatalities or serious injury. Crime Scene Examiners are required to notify the Unit.

Other experts

Depending on circumstances Video Operations Unit, D.V.I teams, other external technical experts, e.g. electrical, gas inspectors etc, as required. Fire Brigade.

Recording

Photography

Coverage

Completely cover the scene by photography liaise with the Bureau Of Air Safety Investigtion officer regarding specific photographs which may be required.

Consider the use of aerial photography to cover the external scene including;

- all marks to the ground around the crash site,
- objects and geographic features, which may have been the cause of the accident.

Pay particular attention to and record; all gouge, strike, ground scars and other marks on the ground, surrounding trees, power lines and any other item, which came into contact with the aircraft. (The impact attitude or angle of the aircraft can usually be determined by the above marks, and they often yield other important clues.)

Photograph the actual wreckage from all four sides, showing views at right angles towards the body of the aircraft. (The crush lines to the body of the aircraft, and other damage to general frame and skin panels, can assist in establishing the impact attitude, and crush distance, that is the distance over which deceleration took place).

Photograph the damage to propellers, from front and side on, as damaged propellers can yield a vast amount of information.

(The tip strike marks on the ground, caused by the propellers, can give an indication of engine RPM and power, as well as aircraft speed, at the time of the accident. The spacing of the strike marks is determined by the number of blades, the RPM and the aircraft forwards speed. Propeller tips bent forward indicate a positive blade angle of attack and hence engine under power, and vice versa. Significant leading edge damage, blades bent against the direction of rotation and/or break-up of the hub also indicate a high RPM and the engine being under power.)

Interior

Photograph the position and location of any deceased persons.

If the pilot is deceased; photograph the position of the pilot's hands and feet on the controls or pedals.

Photograph the dash and other instrument panels to show the position of all the switches. (As mentioned earlier this can yield vital information in relation to the development of the accident.)

Photograph deceased persons in the appropriate manner for D.V.I. procedures if required. (Refer Disaster Victim Identification)

Plans

A photogrammetry survey should be completed for fatalities and serious accidents. The Photogrammetry Unit must be contacted to attend.

Examination

The actual investigation as to the cause of the accident will be completed by the Bureau of Air Safety Investigation. Liaise with Bureau Of Air Safety Investigtion personnel to ensure that the scene is thoroughly recorded.

The police investigation will include the deceased persons,their property, and identification.

Exhibits

Liaise with Bureau Of Air Safety Investigtion personnel regarding:

Fuel samples:

If possible a sample of fuel should be taken from each fuel tank. (usually located in the wings of the aircraft) All samples must be placed in an airtight glass jar, (if possible a minium of 500 ml from each tank is usually sufficient) then sealed and labelled correctly. (This may assist if the cause of the accident or engine failure, was as a result of contaminated fuel, etc.) If possible determine the actual amount of fuel left in the tanks.

Continuing liaison

The Senior Investigating Officer and the Bureau Of Air Safety Officer should promptly be supplied with copies of all relevant information, including photographs and plans.

Copies of witnesses statements assist the Bureau Of Air Safety Investigtion officers by giving examples of questions already covered by Police Investigators. Bureau Of Air Safety Investigtion officers can then concentrate on other aspects of aviation safety relevance.

Reconstruction

This will be performed by Bureau of Air Safety officers.

General preparation and presentation of evidence

Describe observations regarding; propeller, frame, body damage to the aircraft, marks to the ground, trees, power lines, position of controls and switches etc. Present photographs, plans diagrams and charts. Opinion evidence as to the cause of the accident will be supplied by the Bureau Of Air Safety Investigtion, officer.

12.0 Obliterated number restoration and identification

Vehicle - identification

Generally vehicle identification is carried out as the result of request from two sources:

- Investigating police,
- Roads and Traffic authority.

Techniques for the identification of motor vehicles are carried out by using two examination methods;

- chemical etching and
- heat treatment.

12.1 Safety precautions

Training

Only qualified staff should perform chemical etchings.

Chemical etching

Regarding potential hazards, health hazards, fire or explosion, spill or leak, first aid and transportation refer to Appendix A.

Protective clothing & items

Before handling chemicals the following clothing should be worn:

disposable eye wear,

rubber gloves,

boots,

overalls,

- An eye wash bottle filled with fresh water should be easily accessible in the work environment so that it may be used in case of accidental contact.

Application

Chemicals should be applied in well ventilated areas to avoid inhalation of fumes.

Mixing & storage

Full strength chemicals should not be handled by Crime Scene Examiners. The Vehicle Examination Unit is responsible for the mixing, storage and transportation of full strength chemicals, (Refer Volume II - Vehicle Examination Unit).

Etching kit

The solutions provided by the Vehicle Examination Unit should be transported in the prescribed bottles contained within the etching kit. In solution and small quantities the chemicals are relatively safe, however, the same safety procedures should as outlined in Appendix A should be observed regarding general contact and inhalation.

Acetone

Acetone is a highly flammable liquid and should only be used in small quantities. Apply on a rag no more than the size of a handkerchief or regular steel wool pad. Replace cap of container immediately after applying acetone to rag or steel wool. Avoid sparks or any other ignition source.

- If disposing of chemicals (no matter how small in quantity) contact Vehicle Examination Unit.
- Applicators or rags contaminated with chemicals should be sealed in a plastic bag and can be disposed of as regular rubbish.
- safety precautions on and around vehicles, batteries, fuel lines etc

Heat treatment

Only qualified staff who have completed the Physical Evidence, Heat Treatment Course should perform heat treatment restoration.

Safety precautions for qualified staff include:

General handling and first aid as outlined in Appendix B.

With regard to the vehicle:

- a second staff member with a DCP fire extinguisher must be present during the heat treatment process,
- remove radiator cap and battery terminals,

- place wet towels or heat blankets over any fuel lines near the engine pad and over radiator,

- if any smoke eminates, from engine bay remove oxy torch and allow to cool. Remain on stand by with fire extinguisher in case of ignition.

12.2 Initial attendance and liaison

For Roads and Traffic Authority inquires:

All RTA enquires are the result of an examination by an RTA Inspector who has determined that an inconsistency exists with either the engine or chassis numbers on a vehicle.

All RTA enquires should be received by telephone and an appointment made for examination by the owner or agent.

Requests for RTA enquires must be dealt with as soon as possible by the Crime Scene Unit nearest the location of the owner's address, unless there are exceptional circumstances.

Each Crime Scene Unit must maintain a separate (folder) filing system for RTA enquires.

Upon request for appointment, liaise to determine;

- whether owner or agent will be presenting vehicle,

- year, make, model, colour and registration number of vehicle,

- present owner particulars,

- past owner/s particulars, (if available)

- if any original owner's manual, log books or receipts can be produced by the owner or agent regarding purchase, engine replacement, smash repairs, resprays, etc.

- a suitable appointment time to minimise disruption to operational duties and cater for the needs of the owner or agent,

- advise owner that the vehicle will probably be required for a minimum of three hours to complete examination, and may take longer depending on circumstances,

- advise the owner or agent that they must produce driver's licence identification when presenting the

vehicle.

On delivery of vehicle, obtain from the owner or agent:

- relevant paperwork from RTA,
- drivers licence identification (check records),
- original receipts, owner's manual and log books, if available,
- determine if any mechanical parts should be removed to carry out examination and liaise with owner regarding removal, any mechanical or transportation costs are borne by the owner,
- request that owner sign indemnity form before carrying out examination, refer Appendix C,
- arrange with owner to leave vehicle for examination and to contact by phone after examination complete,
- follow general examination procedures to determine whether vehicle is bona fide or stolen,
- carry out number restoration if considered necessary,
- if number restoration not considered necessary, outline reasons in Job book and justify with other records and information which resulted during the course of examination and relevant inquires,
- all original receipts and other documents produced must be photocopied and filed with the relevant paperwork before being returned to the owner or agent.

For cases referred by an Investigating Officer:

- follow the relevant procedures as outlined above,
- suspicious facts surrounding the impoundment of the vehicle,

12.3 Request for experts

Liaise with the Vehicle Identification Unit:

- after liaison with Senior Investigating Officer, notify any vehicles suspected of being part of a stolen vehicle racket,

- for details on location or style of any numbers or other information,
- for specific information which may assist with identification from vehicle manufacturers and distributors.

12.4 Recording

Photography

Photographs to be taken before any examination commences.

Photograph:

- vehicle exterior using two 3/4 views to include the front and one side and then the rear and other side,
- registration label (if affixed),
- front and rear interior,
- any unusual exterior or interior features,
- entire engine compartment,

Take photographs to show:

- general location of identification numbers, plates and labels,
- close up of the actual numbers including a scale,
- general and close up photographs of any unusual or suspicious features, such as weld marks, replaced panels etc.

Photographs to be taken during examination include:

- initial removal of paint and/or grease from identification numbers,
- at each stage of paint removal, to show the condition of the surface and the paint layer sequence until bare metal, lead or body filler is reached,
- initial removal of lead, or other body filler to disguise altered numbers,
- at regular intervals during restoration of obliterated

numbers.

- disclosure of other identification points, features or components on the vehicle that occur during examination.

Note taking

Record details on the Suspect Vehicle Examination Form of all possible identification points. Use additional forms if required.

12.5 Examination

Initial examination

Using information sources, determine:

- location and samples of engine number, chassis number, compliance plate and identification plates,
- if a vehicle photograph is available from these references.

Use reference or other research material to verify:

- make, model and type of vehicle,
- identification numbers and the various manufacturers codes,
- identification plates and labels of the various manufacturers codes for:
  - make, model and type,
  - paint,
  - trim,
  - engine type,
  - transmission type,
  - any other details described.
- any other items, features, or details on the vehicle.

Engine and chassis numbers

Closely examine stamped chassis and engine numbers for any;

- irregularities,
- signs of restamping,
- signs of over stamping,
- forgery of entire number.

Clean the area surrounding the stamped numbers but do not make any scrape marks. Examine for cut and replacement of number via immediate area or the entire panel and photograph.

Remove paint with acetone and steel wool only and photograph (new paintwork is easily removed and original paint may not be affected),

Remove paint by feathering the area to expose the layers from bare metal to the top layer.

Clean bare metal with cloth only, paint stripper may be used, do not use any abrasive materials, to scrape or scratch the surface.

Take a Mirror 3 Extrude cast of the numbers, if any irregularity alteration or inconsistency is detected, photograph cast in position and remove (refer *Technical examinations - comparisons*).

Examine the engine/chassis number to detect if a plate has been attached over the top of the original number,

Body filler, often used to disguise weld marks, or ground down numbers should only be removed by applying acetone, photograph during stages of removal,

Lead wiping is a panel beating technique used to disguise weld marks. Ground down numbers should only be removed by applying minimal heat with an oxy torch and steel brush, photograph during stages of removal, (lead has a low melting point)

Determine the metal type (generally mild steel, cast steel or iron) to carry out a number restoration by using the appropriate techniques and method. (Refer next section, *Number restoration*)

Compliance and identification plates

Closely examine identification plates and labels for;

- replacement plates:
  - damage to plates and photograph,
  - old rivet mark outlines indicating replacement and photograph,
  - possible forgery of the entire plate and photograph.
- alterations to numbers:
  - signs of restamping and photograph,
  - signs of over stamping and photograph.

Take a Mirror 3 Extrude cast of the plates and labels if any irregularity, inconsistency or alteration is detected, photograph cast in position (refer *Technical examinations - comparisons*).

Determine the metal type, (generally aluminium) to carry out a number restoration using the appropriate techniques and method (refer next section, *Number restoration*).

Chemical restoration

Technique (and chemicals) vary for different types of metal (eg. mild steel, cast steel, wrought iron).

Chemical restoration of numbers stamped in mild steel. Cast steel and wrought iron are the metals commonly used for vehicle chassis and engine numbers. However, there are some exceptions particularly with sports and/or european makes of vehicles. Determine metal type before commencing treatment.

Follow safety precautions as outlined earlier for the handling and use of chemicals.

If the surface is clean and free from rust, chemical restoration can commence. Generally, rubbing of the surface with abrasives should be kept to an absolute minimum (to avoid any further obliteration of the original numbers). The surface can be rubbed lightly with fine wet and dry (400 grade) if dull, to enhance contrast.

The following two solutions should be used:

Soluition 1. Copper chloride - 5mg Cupric chloride, 40ml Hydrochloric acid, 30 ml of water.

Solution 2. Nitric solution - 10ml Nitric Acid, 90ml of water.

Application

The chemical solutions can be applied using various techniques. Solution 1 should always be applied first, followed by solution 2. The chemical should be applied at intervals of 1 -2 minutes. Times may be lengthened or shortened depending on the results being obtained.

Techniques

Solutions can be applied using any one of the following methods:

- twist cotton wool around application stick. Prepare two applicators and apply chemicals by placing applicators in the respective solutions. Wipe the surface.
- use tweezers and small cotton balls to apply the solutions as outlined above,
- use two small self pumping pipettes to apply chemicals directly across the surface,
- use two syringes to apply the chemicals directly across the surface,

Aluminium and aluminium alloys

Determine metal type before commencing treatment. Aluminium and aluminium alloys are the commonly used metals for compliance, and manufacturers identification plates. Some vehicle engines, (particularly sports vehicles and some european makes), motor bike frames and engines, pushbikes and camera frames are also commonly manufactured in this metal.

Follow the same procedures as outlined for mild steel, cast steel and wrought iron with the following exceptions:

Do not clean the aluminium surface with abrasives. Remove paint and grease only with acetone.

The following two solutions should be used:

Solution 1. Sodium hydroxide solution - 1gm sodium hydroxide, 9ml water,

Solution 2. Nitric acid solution - 10ml nitric acid, 90 ml water,

Alternate solution

Same as for mild, steel, cast steel and wrought iron. This solution reacts very quickly on aluminium and aluminium alloys. Should only be used when a result with the above solution has not occurred.

Restoration

Chemicals should be applied for a minimum of three hours or until a complete result is revealed.

The exact position of partially or completely restored numbers if appearing below restamped numbers should be noted and also recorded using photography at regular intervals.

If possible a second staff member should corroborate the examination of the restored numbers.

If not detected earlier, etching chemicals may produce an unusual reaction if body filler or lead wiping has been used on the restamped surface. Follow the procedures for removing such materials as outlined earlier.

After treatment

When chemical restoration is complete, surface should be cleaned with a rag by removing any chemicals and coated with a light film of motor oil to prevent any corrosion of the metal.

Computer search

From computer records:

- depending on the results of the restoration, carry out a computer search e.g. stolen or partial, to determine the status of the vehicle.

Filing of case

Case file should include:

- copies of all paperwork presented by the owner,
- examination form,
- any Police computer print outs regarding the status of the vehicle.

12.7 Continuing liaison

If the vehicle is identified as stolen, inform:

- an investigating officer (usually a Detective) at the Patrol nearest the present owners residence,

- refer owner to investigating officer

Supply the Investigating Officer with all relevant details, including:

- any paperwork which you may have received from the owner relating to the vehicle.
- copy of suspect vehicle examination form

The vehicle becomes the responsibility of the Investigating Officer and should be placed in a Police Holding yard.

Motor cycles

Adopt the general procedures as outlined metal type for frame and engine is usually and aluminium alloy. Liaise with manufacturer or distributor.

Marine engines

Adopt the general procedures as outlined. Liaise with manufacturer of distributor.

Cameras

Metals used in camera bodies are frequently an aluminium alloy. Liaise with manufacturer or distributor.

Pushbikes

Metals in pushbikes are mainly aluminium alloy but some makes are manufactured in steel. Liaise with manufacturer or distributor.

Firearms

Liaise with Ballistics Unit regarding the chemical etching and identification of firearms.

12.8 Presentation of evidence

The statement should in point form outline the relevant features of the examination including the location of all examined numbers and plates.

The restoration of numbers substantiated where possible with photographs and corroborating evidence.

Charts depicting the vehicle, location of numbers, plates, and the restoration should be prepared where possible.

13.0 Other

Shooting incidents

Collect cartridge cases and spent projectiles. Liaise with the Forensic Ballistics Unit regarding the collection of such items and interpretation of evidence at the scene. In serious matters such as, death or injury the Ballistics Unit should attend the scene. Refer *Technical examinations - ballistic items, comparisons - photographs, and Specific examinations - death*.

Improvised explosive device

The scene of a suspected improvised explosive device (I.E.D.) is managed by Crime Scene Examiners and officers from the Forensic Ballistics Unit who have been specially trained as bomb technicians.

If informed of an I.E.D. the Crime Scene Examiner (untrained in this aspect) is to contact the nearest Crime Scene Examiner (bomb technician) and/or Forensic Ballistics Unit.

The bomb technicians will assess the situation and carry out render safe procedures.

A full explanation of I.E.D. procedures is specified in Volume 2 - Forensic Ballistics Unit.

Photography

Exhibit

General exhibit photography is the responsibility of Districts (refer Circular 91/103). Where there are unusual circumstances, for example, specialised lighting required, the Crime Scene Examiner will assist when available.

Scene photography

On occasions, a crime/incident scene may only require recording (no physical evidence that requires processing). In these cases, the Examiner should ensure the Senior Investigating Officer is present during photography. Photographs will be then supplied to the Senior Investigating Officer who will present this evidence at the court hearing.

Court attendance

Only in unusual circumstances will Crime Scene Examiners attend court to present only photographs or plans. When this occurs a report should be submitted to the Commander, Physical Evidence Section for subsequent discussions with the Director of Public Prosecutions.

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Technical examinations

1.0 Ballistic items

Ammunition, cartridge cases and projectiles

Collection procedures are included in *Laboratories and experts, and Specialist Units - Forensic Ballistics Unit.*

Gunshot residue

Gun shot residue samples are collected using a specially designed kit. Refer *Laboratories and experts - gunshot residue*.

2.0 Blood stain pattern interpretation

The importance of blood stain patterns should be considered and assessed in context with the entire scene and the circumstances of the case as ascertained by investigating police.

Drops of blood in motion conform to standard principles of physics and therefore a point of origin as well as other useful information can be calculated. This information can support theories about events as they occurred or can confirm or negate explanations offered by suspect/s.

The type of information able to be deduced may include:

- determining the point of impact and the point of origin at the time blood was shed,
- type and direction of impact that resulted in bloodstains,
- movement and direction of persons and/or objects while they were bleeding, welfare
- number of blows or shots,
- position of victim and/or objects during bloodshed,
- movement of victim and/or objects after bloodshed,
- sequence of events (different stains),
- expected injuries to victim.

Scene

Proceed with scene examination as in *General investigations*. Then:

- assess blood stains and take into account contamination of scene caused by ambulance and other personnel when dealing with victim,
- discuss with the Senior Investigating Officer the possible need to conduct a full scene reconstruction using stringline,
- consider using photogrammetry to survey area including major pattern stains,
- take general photographs incorporating the entire stained area, using an appropriate scale (surveyors tape),

- take close-up photographs incorporating significant patterns with a right angled scale at a 90 degree angle perpendicular to the patterns,

- examine overhead surfaces for 'cast-off' stains,

Suspect

The clothing of all suspects should be closely examined as vital blood stain evidence may be located.

- consider that blood staining to suspect's clothes may not necessarily be from the victim,

- consider possible legitimate reasons for the victim's blood to be found on the suspect's clothes,

- blood stain patterns may be found on the sleeves and cuffs of shirts and on the lower legs of trousers. Further, drops of blood might be found on the shoulders and back of a suspect after swinging a weapon,

- inside pockets of shirts and trousers may have blood transferred from suspect's hands,

- type of clothing may show a fabric pattern consistent with that found at the scene,

- suspect's shoes may have blood spatter on the tops of the shoe, crevices and on the sole,

- collect trace evidence and samples for grouping prior to any extensive blood pattern interpretations being carried out,

- take general photographs of clothing with appropriate scale on all sides,

  . make adequate notes relating to location and size of stains and direction if known,

- take close-up photographs of stained areas, highlighted with arrows if necessary using an appropriate scale,

- if clothing is wet with blood, dry flat before packaging,

  . do not fold wet clothing as stains can be transferred to different areas of the garment,

- caution should be used if trying to draw conclusions about the type of staining seen. Various factors can cause incorrect interpretation,

- before giving opinions on any bloodstain evidence, an effort to recreate the patterns through experiment should be made. Consult more experienced staff for advice.

- the Training and Research can be consulted regarding assistance and development of experiments required

3.0 Comparison

Principles

The purpose of forensic comparative analysis is to group compared items into one of the following categories:

- **generalised grouping**, where the two items compared are consistent/inconsistent with the categorisation of class or group, eg. shoe print was made by a K26 Dunlop jogger size 8,

- **individualised grouping**, where the two items compared present unique features which are consistent/inconsistent with each other, eg. a shoe print bearing unique wear patterns which could only have been made by the suspect's shoe,

To determine whether compared items can be placed in generalised or individualised groupings the Crime Scene Examiner must have comprehensive data which supports the groupings. There has been a vast array of scientific research supporting comparison examinations of items such as bolt cutter, jemmy mark, stamp and other identifications. The Examiner must understand and apply this research to carry out comparisons and present expert testimony. The Examiner must also have adequate experience in carrying out comparative analysis techniques before presenting expert evidence.

A Crime Scene Examiner performing unusual types of comparisons involving cutting instruments, machinery or other items on which no current data exists must carry out extensive research and testing before presenting any results to Court. Research should be carried out using scientific methods which, in part, provide data which shows a repeatable frequency of consistent results.

This type of evidence requires experience and understanding of the methodology. Less experienced Examiners who are involved in unusual comparisons should consult with a senior Examiner or the Training and Research Unit to assist them with the determinations for presentation at Court.

3.1 Tool mark

At scenes where premises have been, or likely to have been, forcibly entered a thorough search should be made for tool mark evidence. Marks can be made by tools such as screwdrivers, jemmy bars, bolt cutters, pliers, pincers, crimping tools.

Tool marks are made by the contact of the tool against another surface. Where the surface is metal, characteristics of striated tool marks may appear.

Tool marks can be made by the cutting or scraping, dragging or otherwise impressing of one object against another.

There are two types of tool marks which can be examined and compared:

- **striated marks**, defined by the Association of Firearm and Tool Mark Examiners (AFTE) as "*parallel surface contour variations on the surface of an object caused by a combination of force and motion where the motion is approximately parallel to the plane being marked. These striations are accidental in nature and unique to a common origin (a particular firearm or tool)*",

- **impressed marks**, defined by the Association of Tool Mark Examiners as "*surface contour variations on an object caused by applying force without motion or where the motion is approximately perpendicular to the plane being marked*".

Striated marks

Striated marks are often produced by a sliding, dragging or cutting action between two surfaces of metal. Microscopic parallel lines form across the cut surface.

The striated mark may produce 'identifiable striae' as defined by AFTE as "*striation in the evidence mark which can be identified with reproduced striations in the test marks*".

Factors which influence the ability to reproduce a striated tool mark, include:

- the recording surface,

- implement used,

- the pressure applied,
- the angle,
- the contact points between the surface and the implement,
- the method of cutting, dragging or sliding which produced the mark,

Striated tool marks may be generally left by:

- a screwdriver or jemmy bar used in a metal frame,
- bolt cutters or other cutting instruments such as pliers, crimping tools, guillotines, knives etc.

Striated marks caused by jemmy or screwdrivers

At the scene:

- take general and mid range photographs to specifically locate the mark,
- take close up photographs with a right angled scale at a 90 degree angle perpendicular to the mark,
  - . a tripod with levels should be used,
- metal objects are subject to corrosion and should be sealed in paper bags to absorb moisture. Plastic bags or containers can also be used but may 'sweat' if sealed in a moist environment (particularly if lengthy delays are involved in performing the comparison)
  - . ensure items are dry before packaging (air dried),
- the surface should be examined under magnification for paint and or other trace evidence such as metal fragments, which may have exchanged from the tool or the recording surface, consider that the transferred material may itself be used as a physical comparison, determine whether the material should be cast for physical match and/or if possible collected separately,
- notes should be made of the magnification used and the results of the examination,
- if possible the item bearing the mark (frame of window or striker plate of lock) should be removed, packaged and labelled for later examination under the comparison

microscope,

. before removing such an item liaise with the owner or resident and provide the owner with a receipt,

- if it is not possible or practical to remove the item bearing the mark then a cast should be taken, the cast should be photographed in position so as to identify it,

- if using 'Mirror 3 Extrude' most marks will be large enough to incorporate a tongue depressor into the casting medium,

- the top surface of the tongue depressor can be used to record the relevant details of the case and utilised to apply pressure into the medium whilst it is casting thus minimising air bubbles,

- the striated tool mark left behind on the surface should be examined with consideration to the action used to create the mark, notes should be taken as to the most likely angle and likely pressure that was utilised to make the mark,

Examination

- the suspect tool should be collected from the investigating officer, the tool should be suitably packaged and labelled recording all relevant details (See General investigations)

- metal tools are subject to corrosion and should be sealed in plastic bags or containers (particularly if lengthy delays are involved in performing the comparison)

. ensure items are dry before packaging (air dried),

- photograph the 'blade' of the tool,

- photographs should also include any trace evidence and a scale incorporated in those photographs at a 90 degree angle perpendicular to the mark, (particularly if a physical fit comparison is possible), ideally these photographs are best taken through a microscope,

- if the surfaces of the blade bear any paint and/or other trace evidence (such as metal fragments) which may have exchanged from the tool or the recording surface, consider that the transferred material may itself be used

as a physical comparison, determine:

. whether the material should be cast for physical match and/or if possible collected separately,

. if there is trace evidence on the tool, forward these samples with samples taken from the recording surface to the laboratory before further examination,

Comparison

- by utilising the notes taken at the scene determine the possible actions used to make the mark with regard to angle and pressure,
- make test marks using the tool in soft metal such as lead, to duplicate pressure and angle,
- test comparisons should then be compared with the item under the comparison microscope,
- if the test comparisons lack detail or appear different to the marks made on the actual mark being compared, further test impressions should be made using the same type of metal that was recorded/collected from the scene,
- results of such a comparison may be photographed,

Striated marks from cutting tools (including bolt cutters)

Scene

- the cut item (usually padlock) should be photographed to show location position and to identify it,
- metal objects are subject to corrosion and should be sealed in paper bags to absorb moisture. Plastic bags or containers can also be used but may 'sweat' if sealed in a moist environment (particularly if lengthy delays are involved in performing the comparison),

. ensure items are dry before packaging (air dried),

- collect, package and label the cut items keeping any pieces separate (refer *General investigations*),
- cut items should be examined with consideration to the action used to perform the cut, notes should be taken as to the most likely angle and pressure that was utilised to make the cut,

Examination

- the suspect cutting instrument should be collected from the investigating officer and the instrument packaged and labelled recording all relevant details (refer ***General investigations***),

- metal tools are subject to corrosion and should be sealed in paper bags to absorb moisture. Plastic bags or containers can also be used but may 'sweat' if sealed in a moist environment (particularly if lengthy delays are involved in performing the comparison),

  . ensure items are dry before packaging (air dried),

- the blades of the cutting instrument should be photographed,

- photographs should also include any trace evidence and a scale incorporated in those photographs at a 90 degree angle perpendicular to the mark, (particularly if a physical fit comparison is possible), ideally these photographs are best taken through a microscope,

- if the surfaces of the cutting instrument or cut items have any paint and or other trace evidence (such as metal fragments) which may have exchanged from the tool or the recording surface, consider that the transferred material may itself be used as a physical comparison. Determine:

  . whether the material should be cast for physical match and, if possible, collect separately,

  . if there is trace evidence on the tool, forward these samples with samples taken from the recording surface to the laboratory before further examination,

Comparison

- by utilising the notes taken at the scene determine the possible actions used to make the cut with regard to angle and pressure,

- label each of the two blades by alpha or numeric sequence on both sides to orientate the four possible cutting surfaces,

- make test cuts using the instrument in soft metal such as lead, to duplicate pressure and angle,

- a longitudinal cut should be made with cutting instruments such as bolt cutters along a single length of metal rod, minimising the number of cuts and

comparisons under the microscope,

- test cuts should be made with the cutting instrument and the test cuts orientated and labelled with regard to the four possible cutting surfaces,

- test comparisons should then be compared with the item under the comparison microscope,

- if the test comparisons lack detail or appear different to the marks made on the actual mark being compared, further test impressions should be made with using the same type of metal that was recorded/collected from the scene,

- results of such a comparison may be photographed,

Impressed jemmy marks

This type of mark is a reversed reproduction of the implement on contact with a surface. The mark that is left differs from the striated tool mark as there is no dragging or cutting against the surface.

Most typically these marks are found on wooden surfaces. Wood is a relatively soft material and when pressure is applied an impressed outline of the tool often occurs. In many cases fine characteristics of the tool will be impressed into the surface, especially if it is painted, and these may later be matched with a suspect tool.

Impressed tool marks may be generally left on any surface by:

- hammers,

- punches,

- screwdrivers and jemmy bars.

Scene

- take general and mid range photographs to specifically locate the mark,

- take close up photographs with a right angled scale at a 90 degree angle perpendicular to the mark,

  . a tripod with levels should be used,

If the impressed marks is recorded on a metal surface;

- metal objects are subject to corrosion and should be

sealed in paper bags to absorb moisture. Plastic bags or containers can also be used but may 'sweat' if sealed in a moist environment (particularly if lengthy delays are involved in performing the comparison),

. ensure items are dry before packaging (air dried),

- the surface should be examined under magnification for paint and other trace evidence (such as metal fragments which may have exchanged from the tool or the recording surface). Consider that the transferred material may itself be used as a physical comparison. Determine whether the material should be cast for physical match and, if possible, collect separately,

- the item bearing the mark (frame of window or striker plate of lock) should be removed, packaged and labelled for later examination under the comparison microscope,

- if not possible or practical to remove the item bearing the mark, then a cast should be taken. The cast should be photographed in position so as to identify it,

- if using 'Mirror 3 Extrude' most marks will be large enough to incorporate a tongue depressor into the casting medium,

- the top surface of the tongue depressor can be used to record the relevant details of the case and utilised to apply pressure into the medium during casting thus minimising air bubbles,

- the impressed tool mark left behind on the surface should be examined considering the action used to create the mark. Notes should be taken as to the most likely angle and pressure that was used to make the mark.

Examination

- the suspect tool should be collected from the investigating officer and the tool packaged and labelled,

- metal tools are subject to corrosion and should be sealed in paper bags to absorb moisture. Plastic bags or containers can also be used but may 'sweat' if sealed in a moist environment (particularly if lengthy delays are involved in performing the comparison),

. ensure items are dry before packaging (air dried),

- the blade of the tool should be photographed,

- photographs should show trace evidence and include a scale (particularly if a physical fit comparison is possible). Ideally these photographs are best taken through a microscope,

- if the surfaces of the blade have any paint and or other trace evidence (such as metal fragments) which may have exchanged from the tool or the recording surface, consider that the transferred material may itself be used as a physical comparison, determine:

  . whether the material should be cast for physical match and, if possible, collect separately,

  . if there is trace evidence on the tool, forward these samples with samples taken from the recording surface to the laboratory before further examination,

Comparison

- referring to notes taken at the scene, determine the possible actions (angle and pressure) used to make the mark,

- it may be possible to compare an impressed mark without making any test marks - the tool may be able to be compared directly with the mark,

- the impressed mark should be examined under the comparison microscope with the cast or actual item. Alternately, make test marks using the tool:

  . if in metal, use soft metal such as lead to duplicate pressure and angle,

  . if in wood or painted surface, use similar wood or painted surface to duplicate pressure and angle,

- test comparisons should then be compared with the item under the comparison microscope,

- if in metal and the test comparisons lack detail or appear different to the marks on the recording surface, further test impressions should be made using the same type of metal as the recording surface,

- examine and record points of similarity with the impressed tool mark, if necessary take a cast of the tool and compare the surface and cast under the

microscope,

- the points of comparison may be presented by using photographs on a comparison chart.

Stamp impression

Metal stamp comparisons are the same as any impressed tool mark impression. However, due to wear and sometimes unique manufacture, they may have individual characteristics which can be compared.

These type of comparisons are often required in vehicle identification investigations (refer *Specific investigations - vehicle identification*).

Follow the same procedures as outlined for impressed jemmy marks. Additional procedures are:

- if possible, remove the stamped number and compare with the stamps under the comparison microscope,
- test comparisons may be carried out in softer metals of the stamps for comparison with the suspect stamped material,
- casts can also be taken for comparison.

Examination results

Class characteristics

This classification requires collection of the evidence into a group or class which will specify the type of tool which was used to produce the mark.

Class characteristics of a tool mark might be characterised by:

- shape,
- design,
- size,
- any peculiarities which are reproduced but are not unique to an individual tool mark.

Accidental characteristics

This classification is an evaluation of a combination of conditions which uniquely characterised the item. The

conclusion relating to the examination of a tool mark will result in identification to the exclusion of any other tool. This may occur in striated marks and impressed marks which leave behind characteristic imperfections of the tool on the surface.

Presentation of evidence

The expertise of the Examiner, research material and detailed analysis of test results should be undertaken before reporting conclusively on characteristics of the tool mark.

One of the following conclusions should be made as a result of a tool mark comparison:

- insufficient information to draw a conclusion from the comparison,
- the suspect tool was not used in the incident,
- the suspect tool was possibly used in the incident,
- the tool definitely made that particular tool mark to the exclusion of any other tools.

With regard to the four possible conclusions reporting of examination results fall into two categories:

- **class characteristics** - ability to group and generalise the identity of an instrument which was used to make the impression,
- **accidental characteristics** - ability to specify the unique characteristics that were present on the recorded material and positively identify the particular instrument used to cause the tool mark to the exclusion of any other instrument.

Statements should be prepared setting out the results in detail including points of comparison for identification and individualisation. Charts, photographs and diagrams should be used where possible. Opinion evidence should only be expressed in the statement.

3.2 Shoe and tyre mark

Shoe and tyre mark impressions will be present at many types of scenes. The suspect may leave footwear impressions in the surface soil, carpet, papers or other surfaces or items. Similarly, tyre impressions may be left in soil, grass, driveways and car parks at or near the scene.

Locating evidence

Locating shoe and tyre evidence is reliant on the good basic scene management procedures and methodical searching techniques (refer *General investigations*).

When determining where to establish boundaries to guard a scene, always consider those areas where the person may have entered or left by foot or vehicle. These areas should be quickly cordoned off and immediate attention given to this evidence.

Recording

Photography:

- general photographs showing the position of the mark in relation to an identifiable object,
- close-up photographs taken perpendicular to the mark with right angle scale prior to casting or collection of the mark,
  - . should be taken using a tripod with levels,
  - . a series of photographs holding the flash at different positions to record as much detail as possible. Three angles separated by approximately 120° should be sufficient,
  - . photographs should always be taken using both **black & white and colour negative film.**
- if the mark is cast, photograph showing the cast in situ and in relation to an identifiable object,
- size charts, graphs and casts should have, where practicable, the date, place and Examiner's initials,
- where there are a number of marks in one location, the size charts or graphs should be numbered in either alpha or numeric sequence so that they can be identified and described,

Collection

The item bearing the shoe or tyre print should be photographed, as described above, before collection. Where possible, collect the surface with the imprint. A variety of techniques can be used to enhance the image if collected from the scene, including:

- experimentation using studio lighting; various films and filters to highlight the contrast,

- if on paper or carpet experimentation with various equipment such as the ESDA (if on paper) UV light box, and other various light wave equipment sources infra red etc,

- with applicable chemicals e.g. (amido black, luminol), (chemical enhancement should only be performed after all photographic techniques have concluded, liaise with Senior Investigating Officer as the chemical will alter the original state of the shoe print,)

If an item bearing the print cannot be collected from the scene the print must be recorded and processed in situ.

- if shoe prints in blood are present over large areas on materials such as vinyl floor coverings or concrete the areas should be treated with amido black.

  This is a chemical treatment available through the Fingerprint Section.

  The amido black reacts with small quantities of blood and can greatly enhance the detail of such prints. Blood groupings can still be performed after the treatment but where possible samples of the blood should be collected prior to treatment.

- *Three dimensional impression*

  Where a three dimensional impression has been left at the scene in mediums which cannot be collected, a cast should be taken. This includes impressions left behind at the scene in soft materials such as soil, snow or sand.

  Casting shoe prints and tyre prints in soft materials should be made using dental stone casting medium.

- Shoe prints in dust

  If the shoe print is in dust and the item bearing the print

cannot be collected from the scene, use either:

. the static dust mark lifting device, or

. adhesive lifting material.

All attempts to enhance the image should be carried out to obtain the best possible image for comparison. *Computer enhancement of the image or impression may be useful.*

- after all photographic techniques have been used to enhance the quality of the image it may be possible to perform further enhancement using computer image technology. Although a relatively new forensic tool computer image enhancement has been successfully used in NSW and internationally to:

  . enhance the original photographic image,

  . provide, to scale, clear plastic photographic images for use in overlays with test impressions and production at court,

  For advice on this technique refer to the Training and Research Unit.

Examination

Before shoes are collected for examination, or elimination, they should be photographed where located, eg. worn by the suspect, at the suspect's residence. The photographs should show:

- general photograph showing the person wearing the shoe,

- close up photographs showing the type of shoe, any visible brand or design names and the sole,

The shoes should then be collected, packaged and labelled.

Further photographs of the sole should be taken incorporating a right angled scale.

Before carrying out any test impressions consider whether any other trace evidence may be present on the shoe including blood, soil and fibres.

Coordinate and liaise with external laboratories or experts regarding the processing of trace evidence before conducting test impressions.

Comparison

To conduct a shoe print comparison the following photographs should be printed to scale:

- photographic images taken at the scene and any enhanced images,
- photographic images of the sole of the shoe,
- semitransparent photographic images of the test impressions and, ideally, the scene print. This technique is useful as it:
  - allows direct visual comparison by superimposing the image,
  - provides a quick and accurate means to compare the images,
  - can be later used for court presentation and consideration by jury members and judiciary.

Preparing test impressions

Test impression substances should be selected that will best reproduce the impression left at the scene. In most instances fingerprint ink applied to the shoe and impressed on paper is satisfactory. Fingerprint dust may also be appropriate.

The substance that left the impression at the scene may be used as a test impression, eg. blood, soil.

The procedure:

- a series of test impressions should be made, ideally by a person with the same size foot actually wearing the shoe. The impressions should be carried out to reproduce the shoe print in the same medium or manner that it was left.

  Factors which should be taken into account in reproducing the mark left at the scene include:

  - the weight of the person,
  - gait of the owner, including proneness to instep or outstep,
  - recording surface,
  - recording substance that may be present eg.

blood, dust, mud,

. the pressure applied,

. the manner in which the impression was left eg whilst running, walking or standing,

- a transparency of the test impression should be made to overlay the original print photographed at the scene. The overlay should be to scale and must not distort the actual shoe print impression. Ideally the image should be prepared using photographic or computer image enhancement techniques to minimise distortion.

- test impressions and research should be filed in the case folder and available for presentation at court if necessary,

- if a cast was taken from the scene, then comparison can be made with a cast of the shoe.

Presentation of evidence

The expertise of the Examiner, research material and detailed analysis of test results should be undertaken before reporting conclusively on any unique characteristics of the shoe print.

Statement The statement should include:

- details of the Examiner's expertise in the opening paragraph. Qualifications should include courses, membership of relevant associations or professional organisations and level of experience (years undertaking scene examination, number of comparisons, etc),

- detailed observations and results of size, design and defect patterns of the shoe,

- points of comparison regarding identification and individualisation,

- opinion evidence should be expressed in the contents of the statement,

- explain the points in detail, eg. if the particular point is a scar, then it should be described as a scar with its peculiarity located on the chart,

- other descriptions such as a peninsular, a bulb, an air bubble defect in the sole should all be clearly discussed in the statement.

One of the following conclusions should be drawn as a result of a shoe print comparison:

- the impression from the scene did not display sufficient information to make a comparison with the particular suspect shoe,
- the suspect shoe was not made by the shoe print found at the scene,
- the suspect shoe displays class characteristics which are similar to print/s found at the scene,
- the shoe has accidental characteristic which match those of the shoe print found at the scene.

These possible conclusions can be reported in two categories:

- **class characteristics** - ability to group and generalise the identify of the shoe print at the scene on the basis of any or all of the following: size, shape, sole pattern,
- **accidental characteristics** - ability to specify the unique characteristics that were present on the recording surface and positively identify the particular shoe used to cause the shoe impression to the exclusion of any other shoe.

Information regarding the manufacture of the shoe should be researched, including:

- distribution of that particular shoe,
- numbers manufactured or imported,
- details about it's manufacture which may assist the comparison conclusions and identifying the marks as either individual or general class characteristics,
- other information such as determining the size of the shoe can be done by taking various measurements of certain parts of the sole impression,

Charts, photographs and diagrams should be used where possible.

Comparison chart

The chart should be:

- simple presentation which is easy to interpret,

- include the scene impression, the test impression and scale photograph of the sole, each impression must be labelled,

- identifying points should be clearly marked:

  . a line joining the related points on the shoe and imprint,

  . different lines joining points should not cross,

  . lines should be straight and ending near (not on) the point, to show necessary detail,

  . lines should not end with arrow heads,

  . in cases where a number of points are similar in a particular area, or the area is larger than just one point, use a circle at the end of the line to surround the points,

  . each line should be numbered with no further description.

Court All research material should be recorded and where possible taken to the court hearing.

3.3 Photographic comparisons

Armed holdup

Armed hold up suspects may be identified and arrested on the basis of photographs taken on bank film.

These images are often poor quality and may be enhanced using various photographic or computer techniques.

It may be possible to compare information in the photographs eg. clothing (style, pattern, distinctive features, tears, stains, etc.), hair style, carry bags, etc. with the suspect's features and items found on the suspect or at the suspect's premises.

Where the suspect has been arrested and agrees to be photographed for comparison purposes, the following procedures should be followed:

- examine the bank film photographs,
- determine the angle of the photograph in relation to the camera position and the position of the suspect,
- reconstruct the position of the camera and the position of the suspect - take a series of photographs at different angles and making judgements regarding the position of the suspect's head or body relative to the camera,
- photograph suspect's clothing:
  - lay out in studio conditions,
  - from different aspects.

Presentation

Comparison photographs of the suspect and clothing should be presented on a chart (refer *Shoe comparison*).

- bank photographs should be placed in the centre of the chart,
- clothing photographs and the position of the suspect's facial features should be placed around the bank photographs,
- plastic overlays of photographic images should be used where possible and the images enlarged to the same size for comparison.

4.0 Sketching and drafting

The Courts and investigating Police require scale plans that accurately convey information about the scene, for:

- interviewing witnesses and suspects during the investigation,
- representation of the scene to the Court.

Scale plans Contain comprehensive and detailed information to allow accurate measurements to be taken from the plan.

Sketch plans Sketch plans provide a diagrammatic representation of a scene. However, accurate measurements cannot be taken from this type of plan.

Field measurements

Double base line method

The double base line method uses two base lines (X and Y) which are perpendicular meeting at an origin (0,0). All measurements are taken at right angles from each base line giving each point an x and y co-ordinate (x,y).

All measurements are continuous (running measurements) from the origin (0,0).

Interior scenes In interior scenes the origin (0,0) is usually assigned to the corner of a room. The two walls leading to the origin are then designated the X and Y axes.

The perimeter should be measured first followed by points within the room.

Measured points in the scene should be given a number or letter on the field sketch. Alongside the sketch these points are recorded with their coordinates, as measured along X and then the Y axis.

For regular items which are square or rectangle in shape eg. tables, three measurement points are required. For irregular shapes then all exterior points are required. For round objects such as bins, tables, the centre point and diameter are required.

Exterior scenes Establish an origin and a base line (or two perpendicular base lines). The base line/s could be a fence line or be

manufactured to form the X and Y axes, eg. a fence line becomes the X axis and an imaginary line perpendicular becomes the Y axis.

For road scenes a curve is located by measurements are taken at regular intervals on the arc. For irregular shapes all exterior points are required. For round objects such as trees, tanks etc then the measured centre point and diameter.

Single base line or cord method

This method is mostly used for country road scenes when the double base line method cannot be used eg. no fence lines or the terrain is difficult.

A cord is stretched through the length of the survey. Measurements taken at regular intervals (eg. every ten metres) perpendicular from the cord (eg.to road edge, gravel edge, grass edge and centre lines etc).

On a curve, two straight cords can be taken with the angle of intersection determined by a compass. This method can also be used in open paddocks or beach areas by setting the cord or base line using a compass.

Triangulation method

Three measurements are required in the shape of a triangle from fixed points: the base, the shortest side and the longest side of the triangle.

The base is fixed (eg. a house, shed, fence or two trees). Measurements are taken from each end of the base line to the intended object.

Computer aided drafting

CAD is an acronym for Computer Aided Drafting. The Autocad system is used by the Physical Evidence Section. This system is located in:

Photogrammetry Unit
Level 5
Police Headquarters
151 Goulburn Street
Surry Hills
Phone [redacted]
Fax [redacted]

The CAD system allows quick, high quality, A4 plans to be completed for use during investigations and for production at Court.

Field sketches should be drawn on the CAD form, preferably using the *Double base line method*.

Requests for CAD plans:

- signed by the Crime Scene Examiner,
- measurements must be legible, continuous, complete and drawn to proportion,
- north point must be indicated on the plan (the orientation of the field sketch can be rotated in the CAD plan to show north above the horizontal,
- the request is either sent or faxed to the Photogrammetry Unit,
- the initial drawing will be at A4 size and must be checked and certified by the Examiner,
- alterations can be made by returning the plan to the Photogrammetry Unit.
- the finalised plan should then be provided to the Senior Investigating Officer for use during the investigation (eg. interviewing and canvassing).
- larger format plans can be provided for production at Court.

Presentation

All plans, sketch or scale, should be presented in the following format:

- magnetic north must be pointing above the horizontal ie. pointing to the top on the plan in relation to the title block,
- ensure all relevant detail is included, however, the plan should include the words '*minor detail not shown*',
- plans should, where possible, be mounted on a hard backing for easy presentation at Court,
- where appropriate, photographs should be attached to plans to indicate the views from different angles,
- plans can be coloured with water paints or crayons,

- labelling must be completed with either Kroy letters, scribers or other similar methods for a professional and standardised plan,
- the title block should include the name of the person who measured the scene and the date the scene was measured (a standard title block is shown below),
- include the scale (or approximate scale) and a border surrounding the whole plan,
- a location plan should be provided,
- logos can be used to show where the plan was produced,
- ensure plan details and spelling are correct and the plan is checked against the photographs.

Standard title block

5.0 Modelling

When the crime scene is complex, photographs, plans and maps may not adequately represent the scene. The Examiner may consider constructing a scale model of the scene.

Liaise

Liaise with Senior Investigating Officer and the Department of Public Prosecutions regarding how the model will assist the Court. Models may take many hundreds of hours to complete, therefore consider the overall value the model regarding:

- the complexity of the scene,
- potential for the model to reconstruct the scene for the Court,
- potential for witnesses to use the model when giving evidence,
- whether the model may save court time,
- overall assistance with presenting the prosecution case,
- cost - time and materials.

Preparation

- determine the scale with consideration to the following:
  - human figures are generally available in 1:87, 1:50 and 1:22.5,
  - motor vehicles are most commonly available at a scale of 1:87,
  - other objects may only be available at a particular scale eg. marine craft, planes, trains, etc.,

Type of model

Liaise with Senior Investigating Officer and DPP to determine type of model:

- **indoor scene** - interior layout of premises,
- **outdoor scene** - topographical view of the scene,
- **indoor and outdoor scene** - combines topographical view with removable sections to reveal details (eg. interior layout of the premises),
- **specific object**, eg. marine craft, train, boat, aircraft.

Depending upon the type of model and extent of detail required, the following information should be obtained:

- field sketches and measurements,
- photographs (ground and aerial),
- photogrammetry plan (specify scale and any elevations needed for the model),
- local council, RTA or building plans.

Assembly

Determine:

- size of the model (consider ease of use and transport to Court),
- layout of the model,
- sequence of assembly.

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Roots
Seeds
Wood

8.0 Other specimen

Building materials and safe insulation
Electrical
Podiatry
Scuba gear
Soil

9.0 Experts list

Laboratories and experts

1.0 The expert

There are many experts competent to analyse, interpret and present evidence on different aspects of physical evidence.

Crime Scene Examiner

The experienced Crime Scene Examiner may provide expert testimony on specialised techniques where they have the necessary experience and qualifications.

Physical Evidence Specialist Units:

Forensic Ballistics Unit

- examine firearm or explosive related scenes, firearms and ammunition located at crimes scenes,
- attend and assist Crime scene Examiners with post mortem examinations of a gunshot or explosive related death,
- provide advice to Police and other organisations regarding firearms legislation,
- examine prohibited articles and weapons.

Photogrammetry Unit

- permanent recording of scenes which can be used for scale measurements,
- preparation of accurate scale plans of natural or man made structures,
- provide gradient and camber details, lines of sight information for projectiles and elevations,
- provide Computer Aided Drafting (CAD) plan from field sketches and other graphic facilities.

Vehicle Examination Unit

- examine vehicles, marine vessels and heavy machinery where mechanical examination is required in criminal, coronial or other inquiries,
- examine Police vehicles or vessels where there are allegations of mechanical defect,
- examine vehicle or vehicle parts where the question of authenticity or identification relates to criminal charges.

Vehicle Identification Team

- maintain data base of information on motor vehicles,
- specialist examination of vehicles suspected of being stolen,
- major stolen car investigations,
- liaison between vehicle manufacturers/distributors and Police.

Video Operations Unit

- attend and record on video crime or incident scenes or re-enactments,
- suspect re-enactments,
- provide studio facilities for recording, editing, tape transfer, audio dubbing, black and white prints from video images,
- provide high quality productions of incidents for evidentiary purposes.

Mapping Unit

- provide accurate Police administrative boundary definition and maps provision,
- drafting, graphic design and cartography work,
- court and general presentation work,
- book binding, covering, mounting and laminating.

Photographic Services Team

- studio photography of complicated exhibits, assault victims, portraits, still life, reproductions, macro and microphotography,
- aerial photography,
- external specialist photography,
- technical and practical information and research on photography,
- hand processing of black and white photographs, urgent matters or enlargements.

Coronial Unit

- investigate non-criminal deaths referred by the Coroner,
- provide advice on non-criminal deaths,
- liaise between police and coroner on deaths in custody.

Clinical Forensic Medicine Unit

- provide advice on effects of alcohol and drugs,
- provide advice and interpretation on toxicology,
- medically examine victims and suspects in relation to injuries or medical conditions resulting from crime.

Fingerprint Section

- trained in the search and development of latent prints and recording and comparison of fingerprints.

Other expert police

There is a large reservoir of knowledge and expertise existing within the Police Service and external to the Physical Evidence Section. The Police Rescue Squad (for lighting and scene lighting,search and preservation), Police divers, chaplains and Drug Police as well as mechanics, scientists and engineers within the Police Service.

External laboratories and experts

Physical Evidence Officers frequently consult experts from a wide variety of disciplines to assist in investigations or provide expert evidence during the judicial process. Physical Evidence Officers should be generally aware of the shortcomings of experts as well as their usefulness. The opinions of some experts should not for example be the cause of narrowing unduly the scope of a particular ongoing investigation. All opinions made by such experts should be evaluated as part of the overall collection of information.

2.0 Routine testing

Governments maintain a wide range of scientific laboratories. Some are specially dedicated to forensic testing, others perform this role as only a small part of their overall workload.

Experts attached to Government laboratories are generally qualified in chemical and biological sciences. Scientists are trained in the interpretation and presentation of their results as required by the judicial system.

The Government laboratories are the preferred destination for the initial scientific examination of all Police items. For the purposes of this Manual, the Division of Analytical Laboratories and the Institute of Forensic Medicine are *routine testing* agencies.

Forensic Biology Laboratory
Division of Analytical Laboratories

- examines and interprets findings on biological specimens.

Physical Evidence Laboratory
Division Of Analytical Laboratories

- analyses and interprets findings on the physical and chemical properties of a sample,
- provides services such as the scanning electron microscope (SEM) which can locate and identify chemical composition and physical comparison of minute particles.

Forensic Toxicology Laboratory
Division of Analytical Laboratories

- analysis of post-mortem body specimens and items or samples associated with the death or poisoning of persons (eg. syringes and residues on foil),
- routine screening for a wide range of licit and illicit drugs and a limited range of poisons (such as heavy metals),
- a wider range of toxin analysis can be requested where the laboratory is informed of possible toxins involved in the incident.

Drug Laboratory
Division Of Analytical Laboratories

- analysis of exhibits (usually in criminal drug matters) for content of illicit drugs.

Institute of Forensic Medicine

- pathologists will attend the scenes of homicides and suspicious and unusual deaths (refer *Specific investigations*),
- conduct post mortem examinations on the bodies of deceased homicide victims and suspicious deaths,
- conduct range of histological, serological and other examinations which assist in determining the cause of death.

Other experts

Australian Government Analytical Laboratories
Pymble

The Australian Government Analytical Laboratory (AGAL) is routinely used by the Police Service for investigation of clandestine drug laboratories and should only be notified after consultation with Task Force 4 of the D.E.A. However, the AGAL charges a fee for services.

Staff from this laboratory attend clandestine laboratories and carry out the following functions:

- attend the scene,
- render the scene safe,

- examine apparatus and chemicals at the scene,
- collect any items/chemicals for analysis,
- present findings on the drug laboratory to the court.

(Refer *Specific investigations - clandestine drug laboratories*)

3.0 Non routine testing

Refer Circular 91/23

Experts in many fields have been identified as being able to provide competent analyses and court testimony in particular scientific areas. These have been listed in *Expert list*. Other experts may also be able to provide valuable scientific assistance in the investigation. The following procedure (*non routine testing*) should be adopted:

- the government analyst (Division of Analytical Laboratories) must be consulted,
- careful consideration should be given to the relevancy of the qualifications of an expert,
- consult experienced Physical Evidence Officers, and nominated experts in the *Expert list* in related disciplines to determine the suitability of the expert in their scientific discipline and court procedures,
- determine from the expert:
  - ability to undertake the tests,
  - court experience,
  - duration to complete test,
  - likely detail in certificate and court evidence,
  - cost for analysis of all necessary samples (consider control samples), court attendance, travel costs, etc.,
- consult the Senior Investigating Officer as to the relevancy for the test and the availability of funds (if charged by the expert),
- request the Senior Investigating Officer submit a report for approval of the test to the District Commander. The

report should then be forwarded to the Commander, Physical Evidence Section for discussion by committee (as per Circular 91/23) for use of consultants.

4.0 Submission of items

Paperwork

Information accompanying an item for analysis is included on the Specimen/item examination form (P377). This will assist the analyst on determining the appropriate testing based on the circumstances of the case.

Packaging

All exhibits submitted to the expert should be packaged so:

- no fragments nor parts of the objects are damaged,
- there is no contamination of one exhibit with another,
- surfaces are protected to prevent damage and any preserve any surface markings which may be distinctive,
- damp materials should be air dried in controlled conditions to avoid contamination and sealed in paper bags prior to submission,
- dangerous substances do not cause damage by ignition, explosion, etc.
- delivered as soon as is possible to the expert.

In general small fragments such as paint or glass are best submitted in a small paper bag. If there may be retrieval problems from the bag fold the items in a sheet of paper then place in a plastic bag, sterile plastic specimen container or glass vials.

Clothing and other gross objects are best placed in large paper bags. Though the Crime Scene Examiner should make a gross visual examination of such items before submission to experts, care should be taken in handling and packaging not to lose trace evidence.

Details for packaging different types of items are specified under the individual headings in this section.

Sequencing of expert examinations

Where a number of different examinations must be carried out on an item and there is a danger of destruction of the exhibit in any one of these examinations, a decision must be made as to the sequencing of the examinations.

The decision should be based on:

- relative importance (ie. evidentiary value) of the analysis results to the investigation,
- degree of destruction of the item during testing,

and must be made:

- in consultation with the Senior Investigating Officer and the relevant expert/s.

This decision often has to be made at the scene (eg. processing fingerprints in blood where the use of dusting powder may interfere with the grouping of the blood).

Certificate of analysis

Results of examinations, analyses or tests conducted by experts are usually reported in a certificate.

The certificate states:

- formal qualifications of the expert,
- area/s of expertise,
- results of examination,
- interpretation of results.

The Examiner, on receiving the certificate should:

- read and thoroughly understood the contents,
- consult the expert on any clarification of the contents,
- brief the Senior Investigating Officer as soon as practicable on the findings and implications for the investigation,
- send a copy of the certificate to the Senior Investigating Officer,

- examine the implications, and where possible incorporate the results, of the examination into the reconstruction of the incident or crime,
- refer to the certificate and the findings within the statement,
- attach a copy of the original certificate to the statement,
- where the results have a significant bearing on the investigation, contact the Senior Investigating Officer to arrange a pre trial conference with the Prosecutor,
- take the original certificate to the Local Court proceedings, or if not presenting evidence, ensure the Senior Investigating Officer tenders the original to the Court.

Contents of the certificate

Results reported in a certificate usually confirm or deny the presence of some chemical substance or drug or give a numerical result such as the probability of the outcome (ie. 1 in 10,000 probability for a blood being of a particular group).

The certificate may compare a sample to a control (or reference) sample using the words 'similar' or 'indistinguishable' depending on the range of tests conducted and the samples themselves. Two objects may be seen to be identical in many respects, however, the overall frequency of occurrence of the items can make the result less conclusive. The analyst should be consulted about the implications of the wording on the certificate.

Analysis or inspection by defence

Requests made by the defence for testing:

- applicant is to apply in writing through the Commissioner's Office, providing the following information:
  - . case,
  - . date and place of incident,
  - . item,
  - . reason for transfer of the item.

Once approval has been given and the laboratory has completed the examination of the item for the Police, the Crime Scene Examiner should:

- personally deliver the item to the nominated laboratory,
- witness the removal or alteration of the item,
- return with the item (if not totally destroyed in testing).

5.0 Biological specimens

Blood

Recording of blood splash patterns

Before collecting or swabbing of any bloodstain the Crime Scene Examiner should consider the potential value of blood stain pattern evidence. Refer *Technical examinations - Blood stain pattern interpretation*.

Safety precautions

Safety precautions for collecting blood are the same for any other biological hazard (Refer *Specific investigations - Person related incidents - Safety precautions*).

Blood collection

Blood can be present at a scene in the following forms - liquid or dry.

Liquid samples

The following procedures should be carried out when collecting liquid blood samples:

- consider the item which has blood on it, and if possible, remove the item to the laboratory for examination.
- scoop up the liquid into a sterile container, no other liquid should be added.
- store in fridge but do not freeze.

Dilute bloodstains

Where the stain has become diluted by water or other liquid, it may be difficult to locate:

- consider the item which has blood on it, and if possible, remove the item to the laboratory for examination.
- use the Polilight to locate such stains.
- test using a presumptive test for blood,
- if positive, photograph the stain,

- collect a sample with swab, using as little distilled water as possible.

- dry exposed swab at room temperature in a well ventilated and controlled area before storing to avoid contamination.

- ensure that the swab is completely dry before sealing into any packaging. If the sample is to be transported, store in a brown paper bag allowing air to circulate freely around the exhibit.

Whole blood

Blood taken from either victims or suspects should be handled in the following manner:

- use a sequestrene tube (with pink lid). This prevents the blood from clotting.

  . white lidded tubes (clotted blood only) are less preferable, but may be used in an emergency.

  . blood alcohol bottles contain preservative and must not be used,

- samples should be kept refrigerated, not frozen.

Dry samples

The following procedures should be followed when collecting dry samples:

- consider the item which has blood on it, and if possible, remove the item to the laboratory for examination.

- if impractical to take the item then:

Crusty stain

. scrape stain into a small sterile container,

. seal,

. store at room temperature.

Soaked-in stain

Stains which may be soaked into carpets, mattresses or other material

. cut out section of carpet or mattress and take the

entire sample to the laboratory,

store at room temperature.

Stains on porous surfaces

These may include bloodstains soaked into concrete or brick surfaces where removal may be either difficult or impractical:

- moisten a swab appropriate in size to the size of the stain, ie. use either a large swab, medium size swab or a small swab,
- lightly moisten the swab with water, shake off excess water,
- place the swab on to blood stain and allow for the spot to soak up the blood stain,
- dry exposed swab at room temperature in a well ventilated and controlled area before storing to avoid contamination.
- ensure that the swab is completely dry before sealing into any packaging. If the sample is to be transported, store in a brown paper bag allowing air to circulate freely around the exhibit.

D.N.A.

Deoxyribonucleic Acid.

Any biological material of human origin which contains cells should also contain DNA, ie. blood, semen, bone, dental pulp and skin. Though Saliva does not have a cell structure, it does contain discarded skin cells from the inside of the mouth. Items which may contain saliva (such as cigarette butts) should always be regarded as having the potential for DNA testing. Hair shafts and fingernails do not contain DNA but the roots of hair and skin traces adhering to fingernails do contain DNA.

Relatively large amounts of biological material are required for successful DNA profiling, eg, generally blood stains should be approximately the size of a 20c piece. This technique should be considered where traditional blood grouping techniques fails to provide adequate information or potential.

Identification of decomposed remains

Some of the DNA of an individual (mitochondrial DNA) is identical to that of the mother. This finding can be of use in the identification of decomposed human remains.

Procedure for collection of samples:

- obtain a blood sample from the mother of the possible deceased person,
- arrange for biological samples from the deceased during the post mortem,
- submit for comparison.

PCR

Polymerase Chain Reaction

This procedure provides DNA information on smaller samples by biochemically increasing the amount of DNA.

The samples will first be submitted to the Forensic Biology Laboratory for standard DNA profiling. If the samples are deemed unsuitable for this test the analyst will refer the Examiner to another forensic laboratory for the PCR/DNA testing. If forwarded to the external laboratory then the procedure for non-routine testing must be followed.

Collection and preservation of items

Procedures for collecting, preserving and submitting exhibits which may eventually be subjected to DNA profiling are the same as for other biological sample testing. Samples should be delivered to the laboratory as soon as practicable.

Where more than a few days delay is expected in delivering exhibits to the laboratory, they should preferably be frozen at minus 20°C, in a non self defrosting freezer.

Collecting and preserving samples from persons

Blood should be collected in the sequestrene tubes, as stated previously and kept refrigerated. The sample should be delivered to the laboratory as soon as practicable.

Hair

The examination of hair may yield the following information:

- species of origin of the hair,
- physical characteristics of the hair (colour, tensile strength, thickness),
- chemical characteristics of the hair (trace element analysis and presence of chemical dyes),

- DNA profile of the source individual (requires approximately 10 hairs with roots).

Hair samples collected at the scene should be complemented with samples taken from known sources. The procedure for control sample collection:

- hair samples should only be taken by a qualified medical practitioner.(Refer Specific investigations, Assaults)
- take control hair samples from spouses, boyfriend/girlfriend, or anyone who has had recent close contact with the victim. Depending on the circumstances of the case take:
  - scalp or head hair,
  - pubic hair,
  - body hairs are infrequently taken.
- hair samples must be large enough and representative:
  - take about 40-50 plucked head hairs from several sites on the scalp,
  - take about 20-30 plucked pubic hairs,
- all samples, known or recovered, should be placed in sterile plastic specimen containers.

Hair samples should be submitted first for DNA profiling. Additional testing may be performed for human origin, physical characteristics and some chemical properties of the hair. The Forensic Biologist should be requested to preserve the shafts of the hair samples and at least one complete hair (with root).

Further testing can then be performed by the nominated expert (refer *Expert list*). If necessary, neutron activation analysis of the hair may determine trace element content.

Human tissue

The basic principles involved in the collection of blood should be adopted to collect and package human tissue. Skin, bone or other material can be analysed by the Forensic Biology Laboratory and serological groupings may be able to be determined.

Saliva

Blood grouping may be possible from saliva samples;

- collect item (eg. cigarette butt) and package in clean paper bag (or open container to allow ventilation,
- if unable to collect item:
  - swab the item with a cloth swab moistened with an absolute minimum of distilled water,
  - place the swab in a clean sterile container,
- convey immediately to the laboratory for analysis.

Cigarette butts

Where the brand of the cigarette cannot be readily identified the analyst should be informed and requested to minimise the deformation. This will allow for identification of the brand when manufacturers are consulted.

Bite-mark evidence and saliva in bite wounds

In many assaults, especially those of a sexual nature, the suspect or victim may inflict bite marks.

- contact an odontologist regarding attendance (refer *Expert list*),
- prior to the arrival of the odontologist, the Examiner should follow procedures for the recording bite mark comparison evidence (refer *Technical examinations - bite mark comparison*),
- if a medical officer is attending the person (eg. examining the person, or collecting a Sexual Assault Investigation Kit) ensure they protect the mark,
- the odontologist will supervise the swabbing of the bite area for saliva.
- collect the saliva swab and submit to the laboratory with blood sample obtained from the person allegedly responsible for the bite.
- the odontologist will prepare an impression of the bite mark if it is recent or has broken the skin,
- through the senior investigating officer, obtain permission from the person alleged to have inflicted the mark, for a casting of their teeth by the odontologist,

- Maintain liaison with the odontologist and assist in evaluation of the evidence.

Semen

- search for semen samples in bedding, clothing and lounges.
- use special lighting: Polilight or simple UV light.
- record and photograph any staining showing its orientation and position,
- collect the entire item containing the stain, if practicable,
- if not able to collect the item, cut out the section containing the stain,
- convey to the Forensic Biology Laboratory.

Sexual Assault Investigation Kit (SAIK)

Sexual Assault Investigation Kits are supplied by the Division of Analytical Laboratories.

Supplies of the Kits are held at hospitals and in the Sexual Assault Units in the large public hospitals.

The Kit contains paperwork (Protocol) and various biological sampling containers including a bag for underpants.

The Kit must be completed by a qualified medical practitioner.

The biological samples should be packed in the padded bag, placed in the brown paper envelope, sealed and signed by the examining doctor. The person collecting the Kit also signs the seal.

Collection:

- convey to the laboratory as soon as practicable,
- if there is any delay, cool at approx. 4°C in a non defrosting refrigerator. Delays in conveying such a kit to the laboratory should not exceed 2 weeks.

Clothing:

- clothing of victims and suspects should be examined for evidence, including trace evidence,

- clothing for biological analysis should be packaged individually (refer to *General investigations*),

Other

Entomology

Determination of date of death

Entomology may assist in determining approximate time of death. This science concerns the life cycle of maggots infestation of the body after death.

Maggots feed mainly off the soft protein rich parts of the body, leaving the harder, drier portions such as bone, hair and skin for beetles which may infest the body later.

Procedure for collection of maggots:

- maggots should be collected as soon as possible and in any case before refrigeration of the body,
- collect representative samples of all the varying types and sizes present on the body,
- maggots should be placed immediately into formalin or 70% alcohol.
- collect a live sample of maggots:
  - keep alive in a ventilated sample container (such as 10cm diameter plastic container with gauze top secured with a rubber band to allow ventilation),
  - include a portion of meat, liver is preferable,
- submit specimens as soon as possible to the NSW Department of Agriculture (refer *Expert list*).
- The following information should be supplied with the specimens:
  - date and time body is discovered,
  - location of infestation (in wound etc),
  - location on the body,
  - weather conditions including temperature and rainfall for entire period in which deceased was missing,

- whether pupae were in the soil near the body (if so then these should be collected and submitted in the same way as the maggot specimens).

Marine biology

Aging human remains or other items after long periods of immersion can be very difficult using the usual indicators decay.

Marine biologists may assist by examining biological specimens, in particular Crustaceans, clinging to the body.

- photograph body showing the distribution of the creatures,
- collect a representative sample of specimens from the body as soon as possible and before refrigeration of the body,
- preserve the sample in formalin or 70% alcohol,
- convey as soon as possible to laboratory.

6.0 Chemical specimens

Accelerants

Collection of samples:

- refer (***Specific investigations - Fire, buildings, vehicle, bushfire***),
- if possible collect samples which are wet or porous materials (eg. soil, paper, carpet),
- some porous, non-portable materials such as concrete surfaces are sampled as follows:
  - moisten the surface of the object or ground,
  - place absorbent material such as diatomaceous earth evenly over the surface,
  - leave at least 1 hour to allow for absorption,
  - collect the absorbent material into a kryovac (arson bag) and then into an unlined metal paint tin (arson tin),
  - alway inform the laboratory when using an arson bag inside the arson tin.

Collection of control samples

Some synthetic products (eg. linoleum, glue, varnish) once involved in fire may release fumes during laboratory testing:

- collect control samples of any unusual synthetics sufficiently distant from the area of origin of the fire,
- if impractical, consider purchasing or obtaining samples of the material from the manufacturer.

Packaging of fire items

Arson tins:

- preferred container for samples sent to the laboratory for accelerant analysis, (ie. unlined metal paint can),

If the material is wet and/or a delay is expected in delivery to the laboratory:

- place the sample in an arson bag, then into the tin to avoid corrosion of the container.(inform the laboratory where inner seal is used).

Arson bags:

- varying sizes for larger or odd shaped items unable to be placed into an arson tin,
- where the danger of puncture exists then the item should be doubly bagged,
- if lengthy delays are involved in transporting to the laboratory, the bag should be placed in a refrigerator.

Animal baits and poisons

Safety considerations

Animal poisons are toxic to humans. Consider the safety of children in the area as well as your own safety.

Chemical tests can determine the nature of the poison.

Collection

For suspected poisoned baits of meat, vegetable, powder, etc:

- collect the whole sample in a suitable plastic or glass container,
- refrigerate,

Where valuable animals have been poisoned:

- contact a veterinary surgeon who may remove the stomach and liver (refer *Non routine testing* procedures),
- pack these samples in a post mortem kit (separate kit to bait samples),
- promptly convey to:

  Division of Analytical Laboratories.

In less serious cases, Police may decline involvement and any specimens should be given to the owner for testing by a commercial analyst (at the owner's expense).

Cloths and fabrics

Refer *Fibres*

Fibres

The following information is also applicable to trace evidence in general. Laboratory examination of such trace specimens can yield the following information:

- identification of the type or source of fibre (wool, polyester, etc.),
- analysis of dyes or pigments present in the dye,
- ply and fibre count (ie. number of strands or ply in the thread and the number of fibres in the strand),
- weave structure of fabric.

Locating fibres

Where fibres should be searched for:

- points of entry and exit to a premises,
- anything thought to have been touched by the suspect,
- any item left by the suspect (eg. balaclavas).

Samples should be collected, where necessary, from the scene, the victim, and the suspect (as well as the home of the suspect).

The fibres should be collected by:

- tape lifting using clear adhesive tape (preferably 3M 'Magic' brand),
- lower layers should be sampled but care should be taken not to overload the tape,
- hold the tape tightly and gently pat the surface of the object with the adhesive surface,
- place the tape in a sterile plastic specimen container.

Non fibrous trace particles are best collected directly into sterile plastic specimen containers.

Where fibres or other trace particles are suspected as having been spread over a large area, or where its location is uncertain, vacuuming of this area should be considered. The vacuum intake is filtered through filter paper held in specially designed mounts.

Samples should initially be sent to the Physical Evidence Laboratory for:

- determination of fibre identity,
- analysis of dyes and pigments.

Further examination can be performed where the evidence is considered crucial to the case (refer *Expert list*).

Firearm discharge residues

Residue is released from a discharged firearm from the end of the muzzle and possibly from the breech and the trigger area. The residue is burnt and unburnt primer and propellant.

Testing of residue is performed to determine:

- whether an individual has fired a firearm,
- approximate distance of the discharged firearm to the object.

Method for Firearms Residue Collection Kit:

- wear, for entire collection period, the gloves supplied with the Kit,
- be careful not to touch anyone or any thing, other than the contents of the sample kit (if necessary to touch the subject during sampling, limit contact and change gloves between sampling as necessary),
- complete the questionnaire using the pen supplied with the Kit,
- collect the control sample:
  - ensure the sample is not taken from anything that the subject has touched (ie. contaminated),
  - take from objects within the room or scene, near the subject,
  - remove the sample stub from the tube labelled *control sample*,
  - using the tweezers supplied, remove the paper cover from the adhesive sampling surface,
  - dab the sampling surface randomly over desks, chairs, walls, etc in the area surrounding the subject,
  - seal the stub into the sample tube.
- collect the subject sample:
  - from the back of the subject's right hand:
    - remove the sample stub from the tube labelled *FDR RIGHT BACK*,
    - using the tweezers supplied, remove the paper cover from the adhesive sampling surface,
    - dab the sampling surface over the back and sides of the thumb and fingers of the right hand and across the back of the hand to the wrist,
    - seal the stub into the sample tube.

- from the palm of the subject's right hand:
  - remove the sample from the tube labelled *FDR RIGHT PALM*,
  - using the tweezers supplied, remove the paper cover from the adhesive sampling surface,
  - dab the sampling surface over the inner parts of the fingers of the right hand and the palm to the wrist,
  - seal the stub into the sample tube.
- from the subject's left hand:
  - remove the sample stub from the tube labelled *FDR LEFT BACK*,
  - using the tweezers supplied, remove the paper cover from the adhesive sampling surface,
  - sample from the back of the left hand in the same manner as for the right hand,
  - seal the stub into the sample tube.
- from the subject's palm of left hand:
  - remove the sample stub from the tube labelled *FDR LEFT PALM*,
  - using the tweezers supplied, remove the paper cover from the adhesive sampling surface,
  - sample from the palm of the left hand in the same manner as for the right,
  - seal the stub into the sample tube.
- from a wound on a deceased person:
  - remove the stub from the tube and expose the sampling surface as outlined above,
  - dab the sampling surface around the perimeter of the wound avoiding where possible blood and tissue,

- seal the stub into the sample tube.

- take any other samples as required:
  - use the above sampling procedure,
  - attach an appropriate label to each sample tube,
  - provide any details or description with the questionnaire.

- place all sample tubes and questionnaire into the envelope and seal,
- complete the details on the envelope,
- remove gloves and discard.
- forward the evidence envelope to the State Forensic Science Laboratory, Macleod, Vic by the security courier system,

Advice can be sought from the Forensic Ballistics Unit.

Glass

Sampling of glass should be considered wherever glass has been broken in the commission of an offence. Minute particles of glass are frequently found for instance on the clothes and in the shoes of break and enter offenders.

Such particles are shed over time by the object on which they adhere but it should be assumed that appreciable quantities of glass can be found days or even weeks after deposition. This depends on the surface properties of the object and its treatment (eg. washing).

The procedure for this type of evidence is:

- use special lighting, if necessary, to see the particles,
- photograph, if possible, in situ,
- carefully collect and place into a sterile plastic specimen container,
- collect control samples of the broken glass from the scene. These samples should be at least 1cm square and should have the thickness of the original unbroken material. In the case of glasses which are stained,

painted or have variable thickness, collect all available glass for reference.

- submit to the Physical Evidence Laboratory.

Physical match Where the possibility of physical matching exists, (such as with the matching of glass on roadway with glass remaining in the frame of a suspect vehicle's headlight) all available glass should be collected.

Hit-run vehicle collisions

Where a collision has resulted in broken glass the suspect driver's clothing and shoes should be examined for the presence of minute fragments of glass.

Headlight globes

Microscope examination of fractured headlight globes may reveal whether it was on or not at the time it broke.

Collection procedure:

- take extreme care not to disturb the filament,
- remove the entire globe from the vehicle,
- place inside a container padded with paper towelling or plastic sheeting,
- deliver to the Physical Evidence Laboratory.

Metal

The forensic examination of metals can be carried out by a number of laboratories (refer *Expert list*).

Collection procedures:

- photograph in situ at the scene or on the object, before being moved,
- note the condition and surroundings of the article,
- protect against moisture and chemicals especially acids and other corrosive substances.
- if wet by water, items should be dried as soon as possible,

- if wet by aggressive or corrosive chemicals or substances, wash and dry as soon as possible,
- attached foreign matter should not be disturbed or removed.

If fractured:

- recover both halves, if small use tweezers as fingers can destroy evidence,
- keep separated and carefully protect from any abrasion or damage,
- submit both halves to the laboratory.

Packaging

Items should be wrapped in protective material, eg. plastics bags, stout paper bags or rags. The items should then be carefully packaged to prevent damage and appropriately labelled.

Examination

The examination of failed components or materials may involve a range of physical and chemical tests.

Physical testing includes: specialised cleaning, photography, macroscopy, metallography, petrography, metrology, strength and stress measurement, hardness tests, forced measurement (static and dynamic), surface coating and thickness measurement, non-destructive flaw detection (by appropriate methods), comparison with materials found locally, nationally or internationally.

Chemical testing can determine the composition of the metal, important in studying metal failure.

Paint

Paint requiring analysis may be located either as dried flakes or thin smears.

Collection procedures:

- photograph in situ, with and without a scale,
- collect a smear/whole flake sample (with apparently all the layers of top and undercoat)

For a smear only:

- collect the entire object,
- protect the smear with a sheet of plastic,
- if impractical to take the object then remove the surface with the smear and a control sample of the surface near the smear.

- place items into sterile plastic containers,
- convey to the Physical Evidence Laboratory.

Paper and ink

Paper, ink and documents (handwritten, typewritten, photocopies, printed, etc) should be referred to the Document Examination Unit for:

- examination of handwriting or typewriting,
- organisation of:
  - chemical and physical analyses of the components,
  - fingerprinting.

Plastics

Plastics are encountered as whole articles, fragments, abrasions or smears. They vary considerably in chemical composition and may provide useful evidence (eg. car parts, plumbing fixture, bomb parts). Any plastic considered foreign to a scene should be submitted for analysis to the Physical Evidence Laboratory in sealed plastic bags.

7.0 Botanical specimens

Leafy plant material

Leafy plant material, either dry or fresh should be placed into paper bags or containers and promptly submitted to Botanical Services, Royal Botanical Gardens, Sydney.

Plant poisoning

Procedure for investigating plant poisoning:

- collect all samples in paper bags,
- take a combined sample of the grass or plants and soil in the affected area (approximately 200g of the surface soil),
- take a sample of grass or plants and soil away from the affected area (control sample should be the same size as the poisoned sample),
- submit the samples promptly to the DAL to avoid fungal action and herbicide decomposition.

Roots

Refer Commissioner's Circular 92/38

Roots of various plants can be compared and may be identified. The following procedures should be followed for collection and examination:

- sketch the scene where the root samples were collected and show all trees and shrubs growing in the vicinity including where the root sample was taken,
- collect two to three pieces of root material about 75mm long, samples must be at least 3mm diameter,
- clean thoroughly, if from sewerage pipes, roots should be soaked in disinfectant for approximately 1 hour,
- package in a plastic padded bag to prevent damage,
- prevent roots drying out,
- preferably keep refrigerated,
- forward to the laboratory.

Examination Laboratory examination includes microtome cross sectioning of the root followed by microscopic viewing of its structure.

Seeds

Identification of seeds is commonly required in cannabis

cultivation offences. Comparison of other seeds (eg. grass) may physically link a suspect to the scene or the victim.

The following procedures should be adopted for the collection of seeds:

- quantity of seeds to collect may be determined by the amount available at the scene,
- placed in a small plastic bag or paper bag, then into a plastic container to avoid the seeds splitting, becoming lost or damaged.

Examination

Seeds suspected of being *cannabis* should be submitted to the Seeds Laboratory, N.S.W. Department of Agriculture, 2 Hayes Road, Rosebery, ph [redacted]

The seed sample is examined for presence of other contaminants (eg. matter and seeds other than *cannabis sativa*) and compared with verified reference *cannabis sativa* specimens for positive identification. The seeds are weighed and this information is provided in the analyst's certificate.

Seeds, other than those suspected of being of Cannabis Sativa, may be submitted to Botanical Services, Botanical Gardens, Sydney.

Wood

Refer Commissioner's Circular 92/38

Wood, like root material, can be identified by examination of the microscopic structural features.

The wounds of victims should be examined for fragments of trace evidence including wood, commonly used as a weapon.

Scene:

Where sawn off firearms are used and the firearm is retrieved:

- search the suspect's premises for timber and metal sawdust including sheltered portions of garage workshops,
- place timber or sawdust samples in plastic bags or specimen containers,
- specimens should be dry before packing into plastic containers (eg. specimens taken from wounds to be air

dried),

Refer *Expert list - roots* for location of laboratory/s which conduct timber examination.

8.0 Other specimens

Building materials and safe insulation

Building materials such brick, plaster and concrete, and the insulation material of safes (eg. diatomaceous earth) may be individual in character.

Procedure:

- collect material from:
  - scene,
  - shoe soles of suspect,
  - clothing of suspect,
- package shoes and large articles in large paper bags,
- seal,
- convey to Division of Analytical Laboratories.

Electrical

For:

- electrical circuitry,
- appliances.

Procedure:

- promptly contact the local electricity supply authority,
- request prompt attendance of an inspector (qualified to inspect wiring and appliances for evidence of electrical faults),
- discuss circumstances of the case with the inspector,
- discuss results of the inspector's findings,

For further information on condition of circuitry or appliances (eg. the metallurgical examination of shorted wiring), then

inquiries contact appropriate experts (refer *Expert list* and *Non routine testing* procedures).

Podiatry

Refer *Technical examinations - comparisons*

Consider consulting a podiatrist where:

- a barefoot sole pattern is located at the scene,
- to link a pair of shoes to a suspect.

Procedure:

- record, photograph, examine and collect (this may mean casting the shoe print pattern if in soft material (refer *Technical comparisons - shoe prints*),
- collect several pairs of the suspect's shoes,
- through the senior investigating officer, obtain permission for a podiatrist to plaster cast the suspect's feet,
- convey shoes to the podiatrist,

Where the identity of the owner of a pair of shoes is in question:

- photograph externally,
- provide shoes to podiatrist,
- following expert examination:
  - Remove the upper leaving the sole impression clearly visible
  - photograph the inside of the shoe,
- discuss findings with a podiatrist.

Scuba gear

Refer *Specific investigations - death - drowning, scuba*

Apparatus and the contents of the scuba tanks:

- seal all valves on tank,
- convey to laboratory (refer exhibit list - gases),
- consult Water Police for examination and testing of regulators/buoyancy vests and other equipment.

Soil

Soil samples may be collected from scenes, soles of shoes, tyres of vehicles, suspect's home, etc.

Collection procedures:

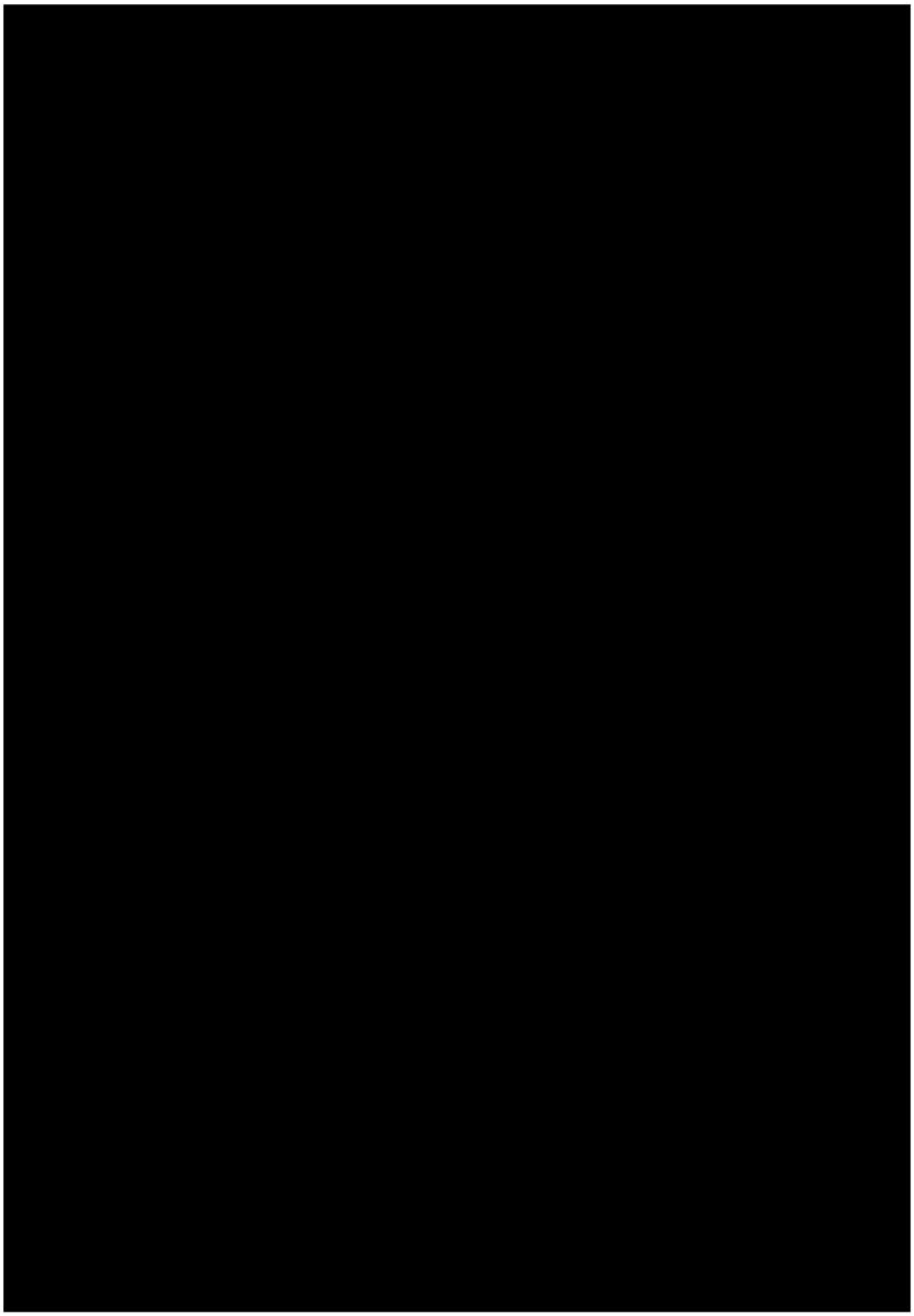
- record the sample location, depth, and the basic geology eg. sandstone, sandy soil etc., vegetation near the sample,
- photograph the area around the sampling site,
- the sample must be representative of the soil material. Soils can vary greatly over vertical and horizontal distances. The Examiner must ensure the sample is representative or collect a range of soil samples. Different soil materials should be not mixed.
- samples must be collected with clean tools and stored in clean containers to protect samples from contamination,
- collect about one kilogram of soil (to enable a range of comprehensive physical and chemical tests), if impractical a minimum of 100 grams is recommended,
- collect control samples,
- samples should be air dried as soon as possible to avoid changes in chemical composition:
  - lay samples on a plastic sheet during collection, if practical,
  - wet samples should not be stored in sealed containers for long periods,
- plastic or cloth bags can be used for storage. Metal containers eg. arson tins should not be used unless essential as these may effect some chemical properties.
- minimise handling of samples.

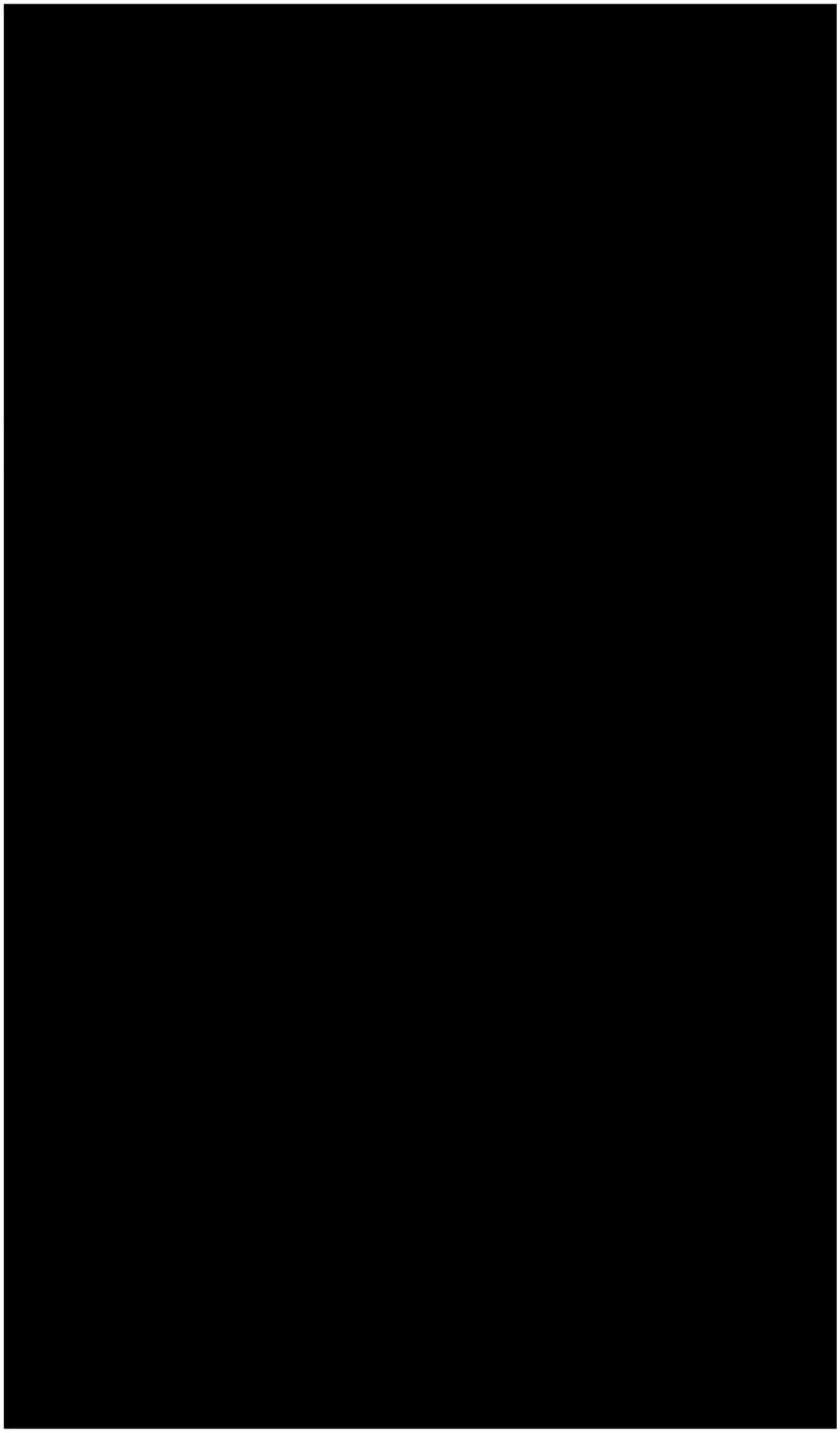
Note: Soil testing is usually destructive.

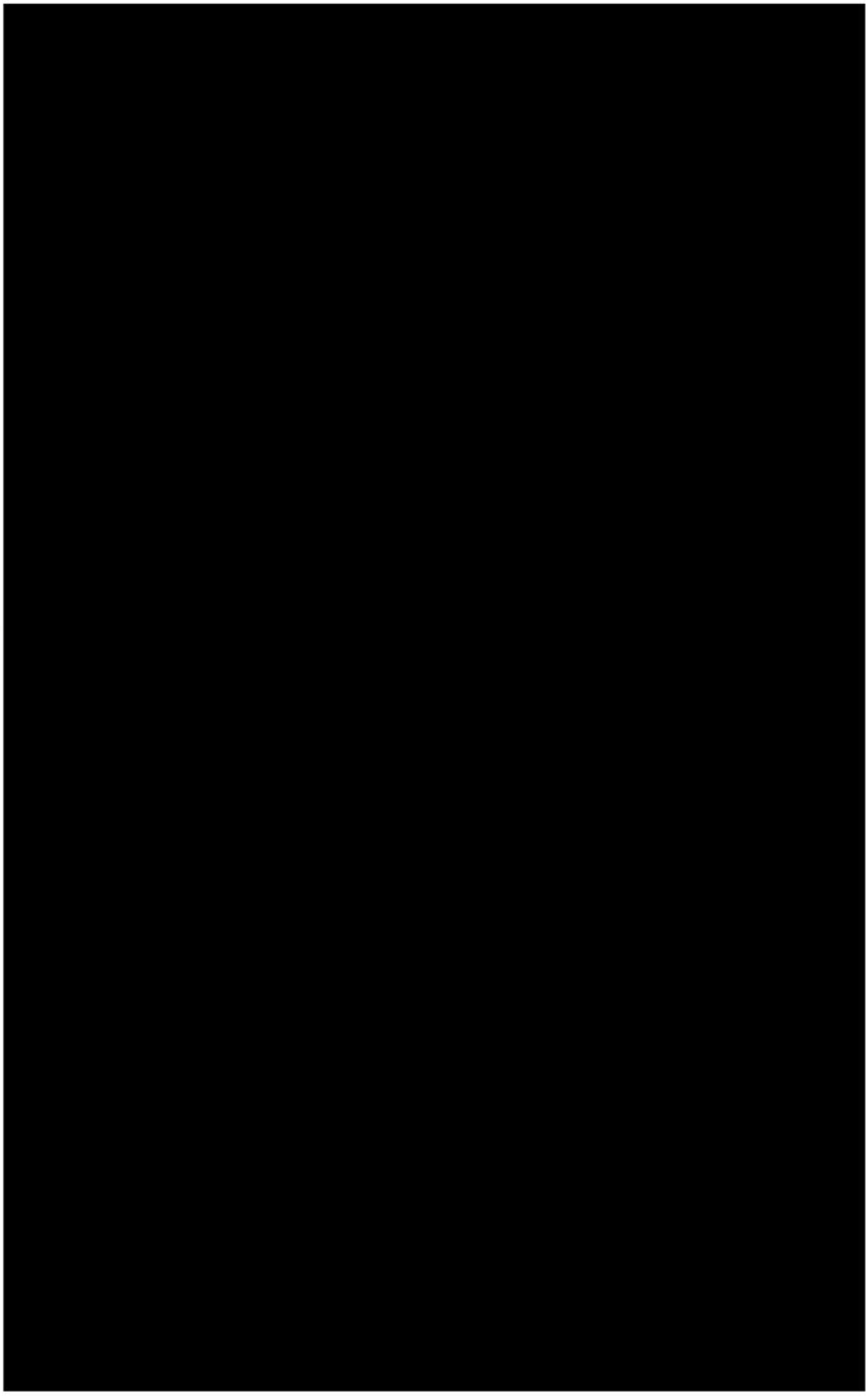
Presentation

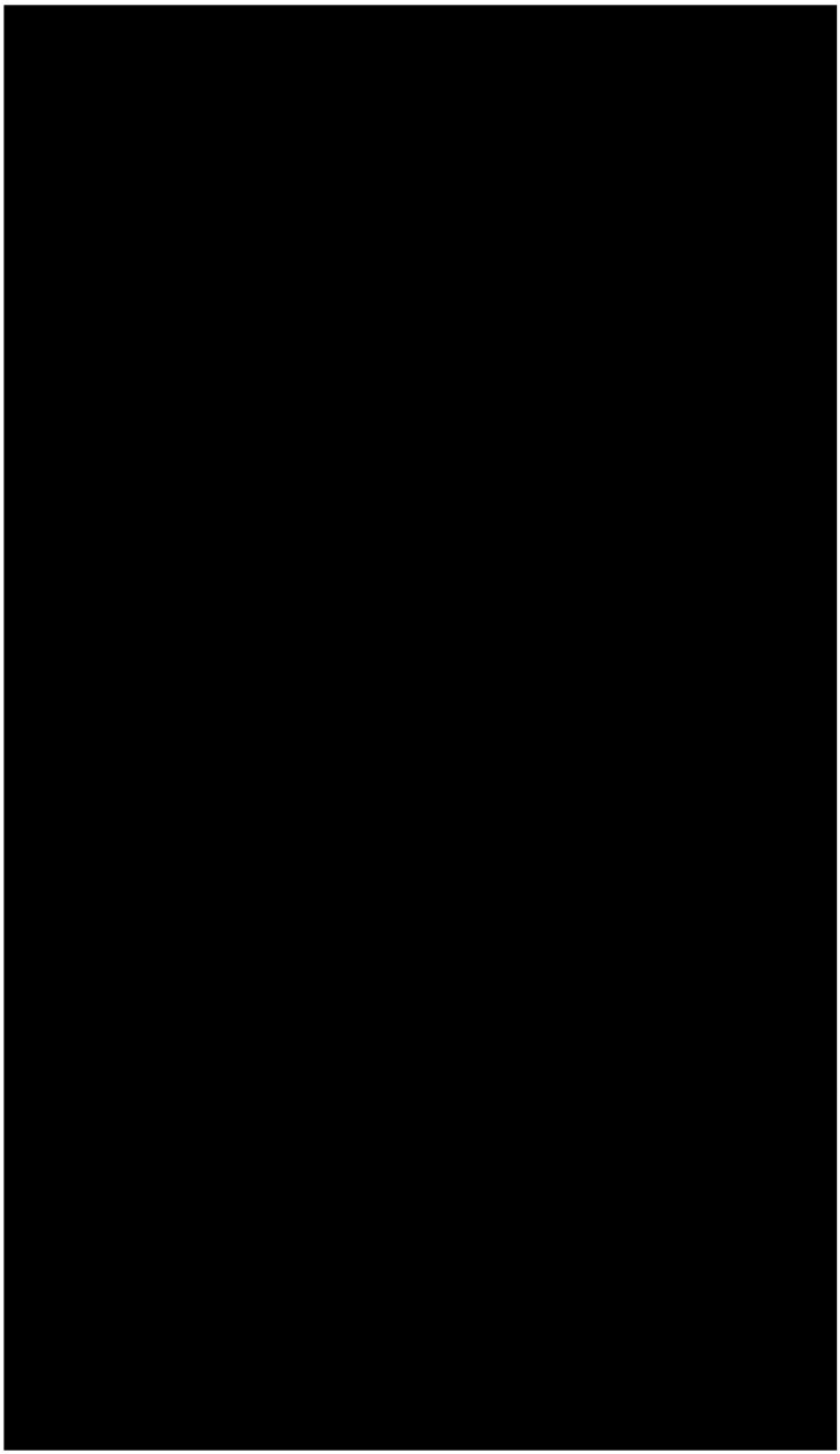
Differences within and between soil bodies means that it is not possible to categorically state that soil materials are from the same soil body. It is possible to be far more positive that soil materials are different. The extent of interpretations:

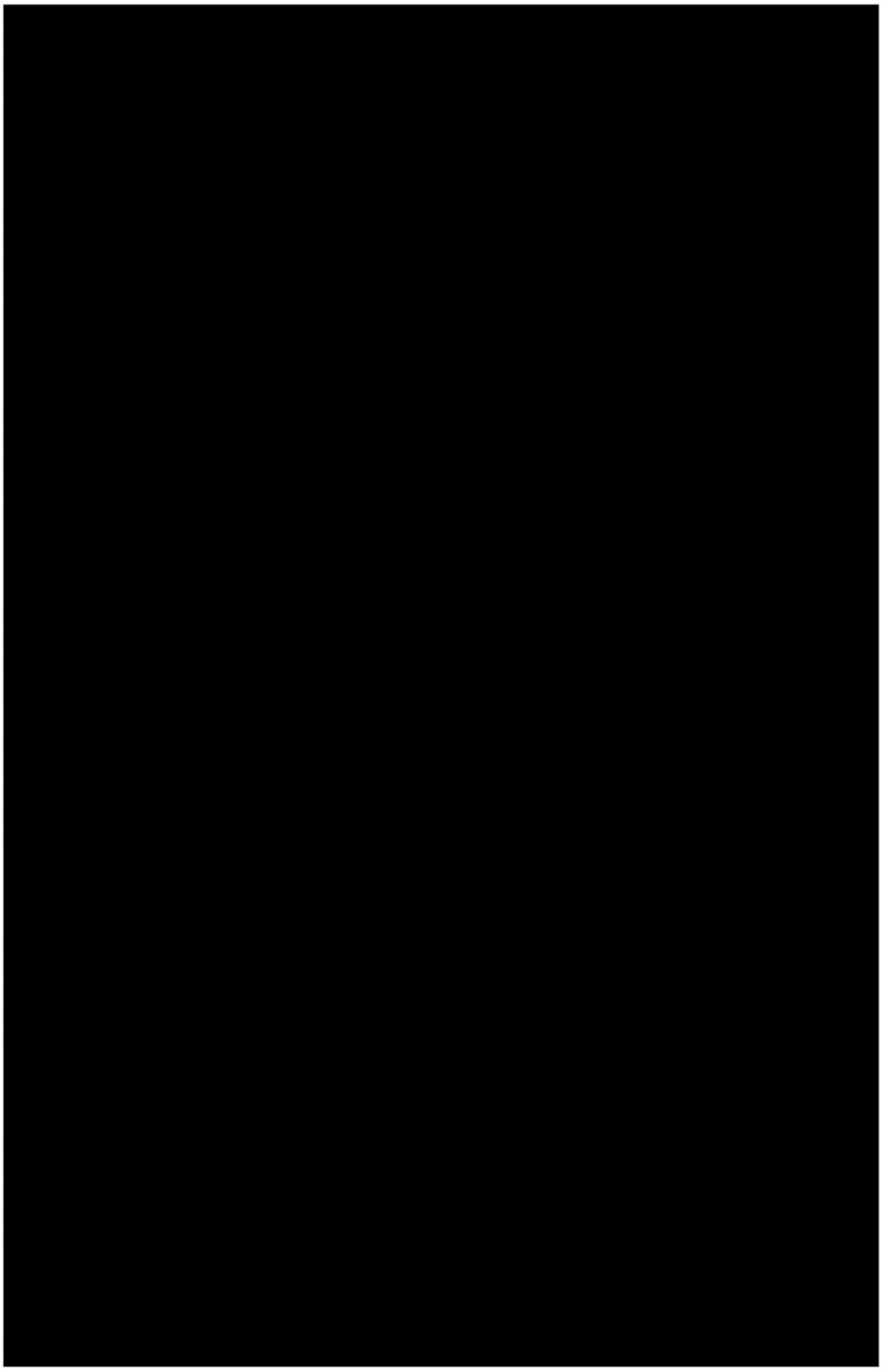
- differences between measured soil properties to indicate that the soil materials are from different soil types,
- similarities between measured soil properties are consistent with the soil materials being derived from the same or similar soil types.

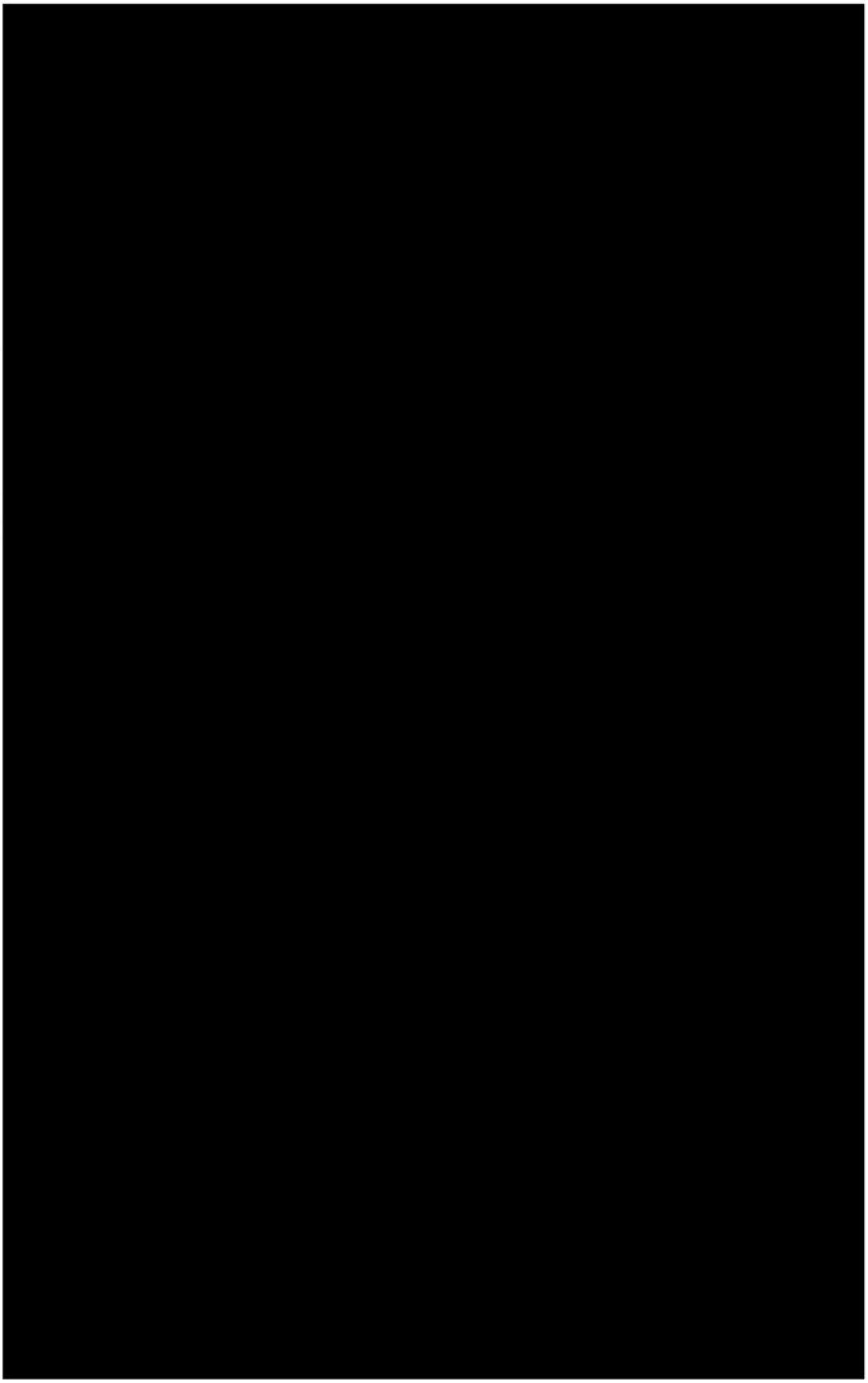


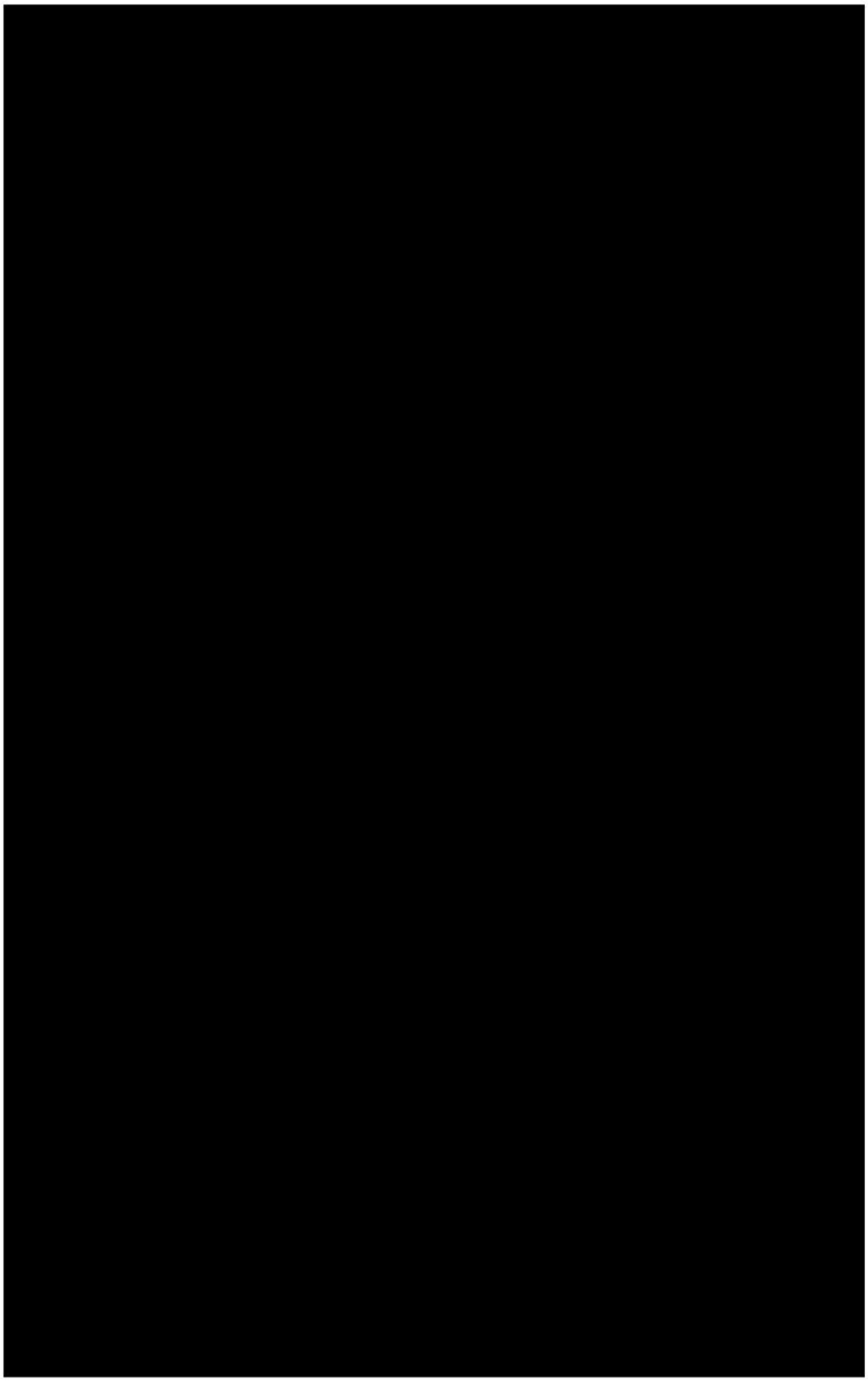


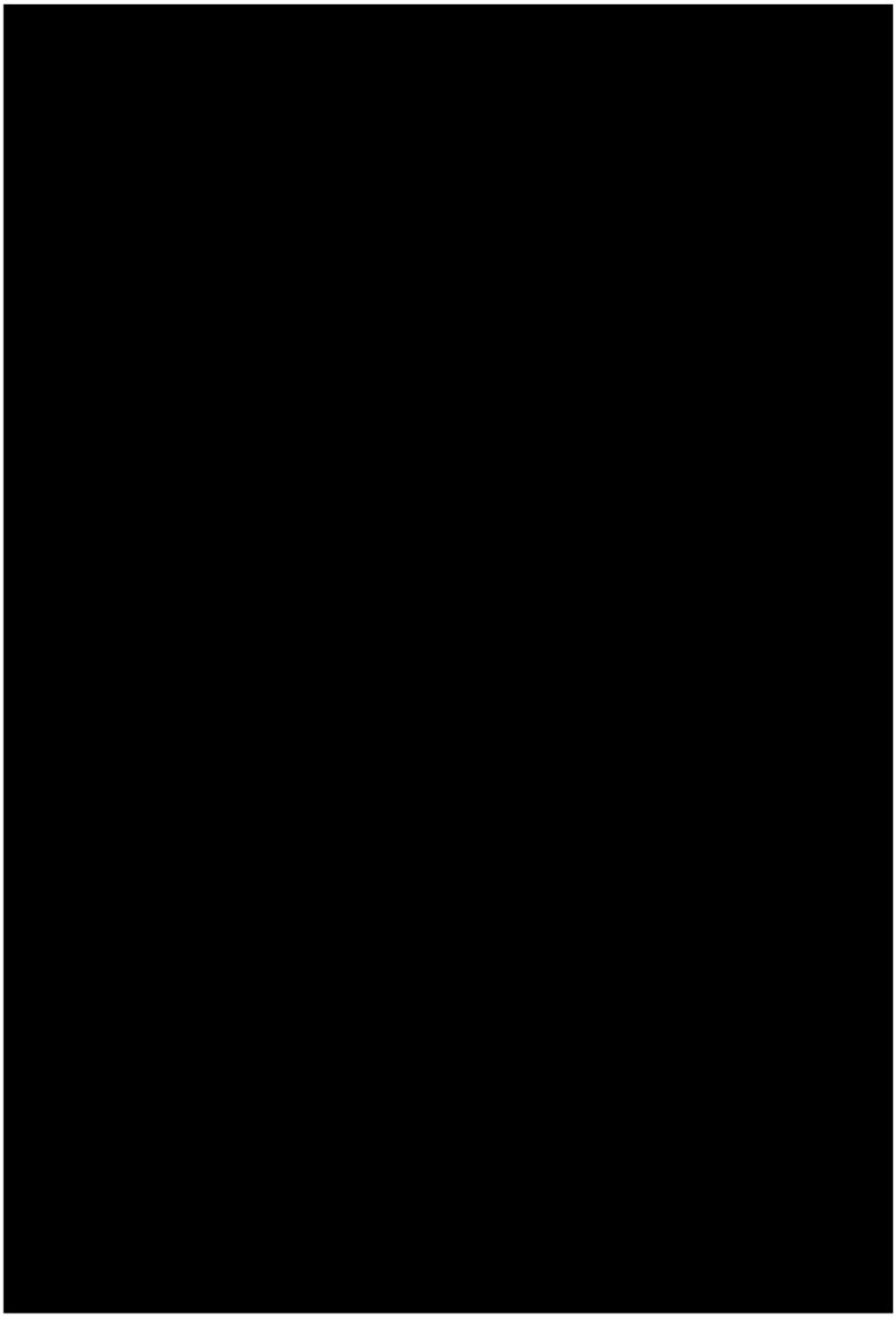












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Facial identification

1.0 Techniques

Facial identification refers to the reconstruction of a facial image of a person (usually a suspect) by a witness to a crime or incident. The Physical Evidence Section uses:

- Penry Photo-fit system,
- Sirchie system using high contrast clear plastic overlays,
- freehand sketching techniques.

2.0 Request

On receiving a request to conduct a facial identification the Examiner should ask and record the following information from the Senior Investigating Officer:

- Senior Investigating Officer's name and location,
- incident:
  - location,
  - date and time,
  - nature,
- witness details including:
  - name, sex and approximate age,
  - injuries and emotional state,
- whether an interpreter is required (if so, then this is arranged by the Senior Investigating Officer),
- brief description of the suspect (as told by the witness) including:
  - sex,
  - age,

- height,
- build,
- hair (colour, length, etc),
- eye colour,
- distinctive features,
- clothing.

Arrangements should then be made for suitable time and place for the interview. This should happen as soon as practical after the time of the occurrence.

The interviewer should then plan for the interview considering the needs of the witness (eg. consideration of their age, level of tiredness, need to rest, emotional state, chance to regain their thoughts, etc.).

3.0 Interview location

The interview location may be at the Crime Scene Unit or the witness' home or other place.

The interview room should be:

- quiet, private room,
- free from distractions for approximately 1 to 2 hours,
- provide facilities which will relax the witness, ie, comfortable chair, tea or coffee, tissues, etc.

4.0 Conducting the interview

The interviewer should be skilled in:

- establishing rapport, displaying empathy,
- listening and remembering information,
- understanding human memory retention,
- using open questions,
- using non-verbal communication techniques,

- controlling the interview.

The interviewer should:

- ask the witness for a brief description of the suspect including:
  - sex,
  - age,
  - height,
  - build,
  - hair (colour, length, etc),
  - eye colour,
  - distinctive features,
  - clothing.
- position themselves so they are not opposite the witness,
- ensure accompanying Police, or other persons who wish to be present during the interview do not sit opposite or distract the witness,
- consider the proportion of facial features in compiling the identification,
- use freehand techniques to provide facial, hair, accessory details, if required.

On completion of the facial identification:

- ask the witness their opinion on the likeness,
- record their opinion (the Examiner may use a score of 1 to ten to gauge the witness' response),
- if considered unsatisfactory, the witness should be given another opportunity to change the compilation,
- if still unsatisfactory, the Examiner should consider freehand sketching techniques,
- inform the accompanying Police and/or the Senior

Investigating Officer the witness' response to the likeness.

- record the segments used to compile the completed likeness in a 'Facial Identification Record Book'.

5.0 Distribution

The facial identification should be:

- high standard (ie. clear, neat),
- checked by the Unit Leader,
- photocopied and the reverse side the Crime Scene Unit name and date recorded.

The accompanying Police officer should be given:

- several photocopies,
- verbal description of the suspect (with consideration to the suspect's ethic description as per Commissioner's Circular 92/40),
- the witness' opinion of the likeness,

The Senior Investigating Officer (if not the accompanying Officer) should be contacted and given:

- verbal description of the suspect (with consideration to the suspect's ethic description as per Commissioner's Circular 92/40),
- the witness' opinion of the likeness,
- black and white photographs (6 copies), if required.

Records should be maintained at the Unit:

- 'Facial Identification Record Book' should record the segments used to compile the final likeness,
- the book should include a copy as supplied to the Senior Investigating Officer,
- negatives should be filed for future requests from the Senior Investigating Officer or Crime Stoppers.

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Disaster operations

1.0 Introduction

The NSW State Coroner has certified that an incident is classified a *disaster* if the incident has caused the death of 4 or more people.

Disasters involving numbers of deceased persons may arise as the result of fires, explosions, storms, floods, transport collisions and other incidents.

Many deceased victims of disasters are badly mutilated or burnt to the extent where visual identification is unpleasant or impossible. Positive identification must then rely on other means such as fingerprints, clothing, jewellery, dental characteristics, medical conditions, etc.

Disaster Victim Identification is the responsibility of the Physical Evidence Section. Through the authority of the State Commander, all Physical Evidence resources may be used should the need arise, irrespective of location or command.

The following procedures should be followed, however, in some instances slight modifications may be needed.

Legal responsibility

The State Emergency and Rescue Management Act (Section 50) places responsibility on the senior member of the Police Service present at a disaster operation to supervise and coordinate emergency service personnel and related agencies.

Under the NSW Coroner's Act, the Coroner empowers Police with the responsibility to investigate an incident which has caused the death and/or injury to a person/s and to assist in establishing the identity of any deceased person/s.

Aside from the role of disaster victim identification and criminal investigation, Police must also consider any subsequent civil litigation issues, eg. building construction design, work practices, etc. These may involve other investigating agencies such as the Department of Industrial Relations, Bureau of Air Safety etc.

Coroner

At disasters where death/s have occurred, it is the responsibility of the Coroner to:

- identify deceased persons,
- identify the time, date and place the death/s have occurred,
- determine the manner or cause of death - including the circumstances surrounding the death.

The Coroner has an obligation to the community to examine the incident and determine if any recommendations be made to the appropriate authority which may minimise the risk of further deaths in similar circumstances.

Purpose of investigation

The purpose of the investigation of a disaster is twofold:

- primarily to investigate the incident so as to establish cause/s and identify any criminal or civil negligence (follow procedures specified within this Manual appropriate to the nature of the incident, eg. fire, vehicle collision).
- identify deceased persons (DVI),

With regard to DVI there are social, religious and legal requirements for the positive identification of deceased victims.

- legal: probate, identification for burial, public records (i.e. Register of Births, Deaths and Marriages),
- religious: method of burial,
- social: next of kin, friends and associates.

2.0 Notification

On notification of a disaster the Crime Scene Examiner should establish:

- extent of the disaster,
- approximate number of deceased persons,

- the exact location of the disaster site,
- if the Unit or Zone has the resources to deal with the request.

The Crime Scene Examiner **must** notify:

- Unit Leader
- Zone Supervisor
- Operations Coordinator (who will brief the Commander, Physical Evidence Section if required).

The Unit Leader, Zone Supervisor or Operations Coordinator nominee may make a preliminary assessment on the size and extent of the disaster and arrange:

- equipment (refer Appendix G-1)
- trained personnel (refer Appendix G-2)
- transport.

Operations Coordinator

The Operations Coordinator (or nominee) is responsible for:

- oversighting all D.V.I activities including body transportation requirements
- giving briefings to the Commander, PES and other personnel as required.
- assisting the PES Commander where appropriate.
- ensuring resources are deployed to Zone, where requested and monitor welfare aspects.

Commander-Physical Evidence Section

The Commander, PES is responsible for:

- liaising with the State Coroner and Director Institute of Forensic Medicine
- authorising expenditure for DVI processing,
- monitoring progress of Physical Evidence operations,

- briefing the Police Minister and Senior ranks of Police Service.
- providing facilities for sustenance, rest and personal hygiene
- liaising with personnel from other emergency services organisations.
- briefings and de-briefings of staff assigned to the incident

3.0 Initial attendance

The management of the scene of a disaster should follow the general crime scene procedures as outlined in *General investigations*. At large disasters a DVI Control will be established. Crime Scene Examiners will register and receive their duties from the Control.

Occupational health and safety

- adopt protective measures as outlined in *Specific investigations* with respect to the type of incident, the primary and secondary hazards, and hazards from salvage operations,
- individual Officers and supervisors should be aware of the mental and physical stressors which are present at disaster scenes. Officers should be aware of their own and their colleagues' well being. Supervisors should closely monitor individual Officer's welfare and provide adequate meal breaks, rest periods, rotation of duties and relief.
- rest areas for should be removed from the immediate site, where possible,
- shifts should not exceed twelve hours continuous duty, where possible,
- all injuries to staff should be reported to DVI Control,
- Officers attending the disaster should have access to critical incident stress debriefing.

Primary responsibility

Criminal investigation

The primary concern at any disaster is the investigation of the incident to establish the cause. Correct scene procedures must be adopted prior to extrication and identification of bodies. The scene must be thoroughly recorded and examined. At a large disaster site DVI and criminal investigation may be undertaken by different groups. However, both functions will require coordination and liaison.

Organisation

The organisation and management of a disaster scene is dependent on the nature and extent of the disaster scene and the number of deceased.

The following procedures outline the organisation for a major disaster. This procedure can be modified for smaller incidents.

4.0 DVI Control

Responsibilities

The DVI Control will be managed by the DVI Coordinator (held by an experienced Physical Evidence Officer). This Officer is responsible for:

- managing the DVI operation,
- liaison with the Emergency Control Centre, Physical Evidence Commander, as required,
- establishing control centres, temporary morgue, rest areas, equipment stores and provisions,
- briefing, organising and dispatching all DVI teams and associated groups involved in DVI processing,
- implementing Occupational Health and Safety procedures for DVI and crime scene examination personnel,
- coordinating operations of:
  - . crime scene examination,
  - . disaster victim identification,

- DVI teams,
- temporary morgue,

- maintaining a log of DVI and crime scene examination personnel working at the site for rostering of shifts, meal breaks, relief,
- arranging the transport of, and maintaining a log of, bodies to the permanent morgue,
- dispatching photographic film for printing and processing.

Upon arrival at the scene of a disaster, the DVI Coordinator and DVI Site Controller must:

- appraise the disaster scene, with the view to obtain sufficient information for a briefing of DVI personnel,
- establish contact with the Disaster Scene Controller informing him that DVI personnel are in attendance at the site,
- establish a secured DVI Control Centre as near as possible to the Forward Command Post of the disaster site,
- establish reliable communication links with:
  - Zone supervisor
  - Operations Coordinator
  - Commander - Physical Evidence Section

Request for experts at the scene

The DVI Coordinator should establish if expert assistance is required at the scene. The following experts should be considered:

Coroner The Coroner may attend a disaster scene.

Government Medical Officer

The Government Medical Officer must attend all disaster scenes involving deceased persons in order to examine deceased victims and endorse the attached "DEAD" tags.

Forensic Odontologist

Forensic Odontologists should be notified, particularly where bodies are incinerated and/or are grossly mutilated.

Photogrammetry Unit

Photogrammetry personnel should attend to prepare accurate plans of wreckage, debris, bodies and other objects or structures.

Video Unit

The Video Operations Unit may attend to record the scene.

Briefing

The DVI Coordinator should conduct briefings with all DVI personnel regarding the incident, site and deployment of all Officers. Briefings should be provided at the commencement and completion of shifts.

Briefings should include:

- nature of the disaster, possible number of deceased persons and the condition of the bodies,
- weather reports, forecasts, warnings,
- topography,
- occupational health and safety procedures and site hazards.

DVI teams

DVI Control establishes and coordinates DVI teams and activities:

- establish the role of individual team members, eg. photographer, searcher, recorder,
- assign teams to specific areas, shifts, rest periods and relief.

Logistics

DVI Control establishes:

- equipment (see Appendix G-1),
- facilities and provisions (eg. food, water, toilet arrangements, rest areas, etc),

- human resource requirements during the investigation,
- lines and method of communication.

5.0 DVI team roles

- DVI teams will be formed comprising of three Police personnel of which at least one will be a Physical Evidence Officer,
- unless directed otherwise, DVI team members will work alternate shifts of twelve (12) hours, with rest periods during that time,
- DVI team members will always wear full protective clothing, including boots, overalls, safety helmets and other items as deemed necessary whilst working within the disaster site,
- all injuries to DVI personnel must be immediately brought to the attention of the DVI Coordinator,
- individual team members have a responsibility to advise the senior Physical Evidence Officer in attendance of any difficulties they anticipate or are experiencing in performing this type of duty,
- each deceased person should be issued with a "DEAD" tag (white background with black printing), which should be securely attached to the body, and **must** be signed by a medical practitioner before DVI processing of that victim commences,
- half a body or more will be treated and processed as a 'body',
- less than half a body, provided that it is of sufficient size or characteristics as to stand a reasonable chance of being determined to be part of particular body, will be treated as and called a body 'SPECIMEN' and be issued an appropriate number. Body 'Specimens' do not require a 'Dead' tag or certificate certifying life extinct.
- scenes should be accurately recorded to locate the positions of bodies. Each body should be in some way tagged or identified for overall location. e.g. stakes with reference number tags may be used to locate the position of bodies. Photogrammetry and aerial photographs should also be used where appropriate.

- team members will perform one of the following roles:
  - Photographer
  - Examiner/Observer
  - Recorder

Photographer

- all photographs are to be taken with colour film.
- photographers will take the following photographs at the scene:
  - full length of body as it appears in situ.
  - full length of body showing a permanent background reference point from which the body may be positioned within the scene.
  - head and shoulders of the body from straight above.
  - at a later stage within the temporary or permanent mortuary, photographs of face, jewellery, scars or tattoos etc. may assist in identification.
- each photograph must clearly depict the reference number corresponding to the 'DEAD' tag attached to the body,
- where a body of a flight crew member is located at aircraft accidents, extreme care is to be taken in recording the exact location of the deceased. In regards to this, it may be necessary to take a number of additional photographs of the body in situ.
- exposed film used by DVI team photographers, must be deposited with DVI Control,
- adopt safety procedures and wear protective clothing

Examiner

Examiners are responsible for:

- assisting the photographer where necessary,

- examination and physical handling of bodies, 'Specimen' parts and property actually found on or attached to the body or body 'Specimens',
- physically placing the body, body 'Specimens' and/or property into suitable plastic bags or plastic wrapping, which will be labelled with the appropriate body/property number,
- limbs should not be severed to recover the remains in an expeditious manner, as this may alter or affect the identification of deceased persons,
- where necessary to extricate a body from wreckage, and it is not possible to do so by hand, the DVI Site Coordinator must be contacted to arrange for specialists and specialised equipment to be made available,
- adopt safety procedures and wear protective clothing,

Recorder

Recorders are responsible for:

- accurate recording and completion of the relevant sections of the DVI form (Pink section, Parts B,C,D,E,F),
- accurate completion of any tags or other documentation required by the DVI team,
- ensuring that whilst dealing with a particular deceased victim, that any documentation in relation to that deceased bears the correct DVI number as that printed on the attached 'DEAD' or 'SPECIMEN' tag,
- use and custody of any portable radio equipment for that DVI team,
- adopt safety procedures and wear protective clothing.

DVI forms

- should be completed to ensure attention to detail and accuracy,
- yellow section of the DVI form (Parts A,D,E,F,I) is for antemortem information. This section is completed by those Police nominated to interview friends and relatives of possible victims involved within a disaster. The

information on these forms will later be compared with the post mortem information contained on the pink section (Parts B,C,D,E,F,G,H,I) of the DVI form.

- pink section of the DVI form (Parts B,C,D,E,F) is the section of the form that is completed by the DVI Team Recorder. It is vital that the DVI number, which appears on the 'DEAD' or 'SPECIMEN' tag attached to the deceased, be recorded accurately on every sheet of the pink section, or any other DVI documentation associated with that body.

- when locating a deceased victim in situ at the disaster scene, the DVI team Recorder will initially complete the DVI Form recording all possible details.

- body should then be adequately photographed as per instructions and removed to the temporary mortuary, where further descriptive details can be obtained.

- one DVI form is to be completed per body or specimen part.

- when completing information on DVI forms, do not use descriptive terms such as, **'MEDIUM'** or **'AVERAGE'**, as these are of no value in the describing of physical features of deceased persons.

Property control

Personal property ie. documentation, jewellery etc., can be important physical evidence in the positive identification of disaster victims.

Overall property control a the disaster scene is the responsibility of nominated uniform Police.

However, all property adhering to deceased victims or specimen parts, is the responsibility of DVI personnel.

Property found on deceased victims will remain with that body for further detailed examination by the DVI teams.

All necessary action must be taken by DVI personnel to ensure the security of property attached to the deceased victim.

During detailed examinations of deceased victims, the DVI examiner must securely package any removed personnel property, and clearly label the packaging with the 'DEAD' or 'SPECIMEN' tag number in regards to that victim.

6.0 Temporary morgue

The temporary morgue should be:

- operated by at least two experienced Physical Evidence Officers,
- located as close as practicable to clear vehicle access routes,
- closed-in and protected from public or media view,
- guarded from entry of unauthorised personnel,
- direct communication access to the DVI Control Centre.

The temporary morgue controller will:

- receive deceased bodies and specimen parts from the DVI teams,
- ensure strict hygiene procedures are carried out within the temporary mortuary,
- ensure the security of the temporary morgue from unauthorised personnel,
- record details of the:
  - DVI team number conveying a particular body to the morgue,
  - 'DEAD' tag number in relation to the body brought to the morgue,
  - time of receipt of the body into the mortuary,
  - time of completion for DVI team working on a particular body within the morgue,
- inform DVI Control of the availability of DVI Teams, at the completion of their duties in regards to a particular deceased victim,
- inform DVI Control of the movement of deceased victims between the temporary and permanent morgues.

Transportation of bodies

Transportation of deceased victims to the permanent mortuary will be provided by the local Government Contractor.

Alternative arrangements may be made for the transportation of a large number of bodies, and this should be referred to the DVI Coordinator.

7.0 Post mortem

DVI Permanent Morgue Controller

The position of DVI Permanent Morgue Controller should be held by a senior experienced Physical Evidence member.

Duties and responsibilities include:

- coordinate arrival of deceased victims to permanent morgue, ensuring bodies and specimen parts have been allocated correct DVI numbers as per DVI documentation,
- supervise members of the DVI teams and interviewing personnel at the permanent morgue,
- ensure that correct DVI procedures are adhered to,
- ensure that all DVI team members wear appropriate protective clothing,
- monitor the mental and physical well being of DVI personnel,
- ensure that adequate meal breaks and rest periods be taken by DVI personnel,
- ensure the re-supply of consumerables to DVI personnel. eg. DVI forms (antemortem & post mortem sections), film etc.,
- maintain communication between DVI Control and the Commander, Physical Evidence Section,
- liaise with Doctors, Pathologists, Odontologists,
- arrange personnel and suitable location for the photography of jewellery and personal items from deceased victims,

- coordinate information flow between DVI teams (post mortem) and Interviewers,
- arrange for the viewing of deceased victims by friends/relatives,
- coordinate retrieval and receipt of dental records,
- coordinate reception and DVI processing of disaster victims which have died at a hospital.

Control

At the disaster scene a deceased victim will be given a DVI number (located on the 'DEAD' tag). This number will identify that victim throughout the duration of the DVI operation.

Under no circumstances is the victim to be identified through the allocation of a Permanent Morgue number (given at the time of reception of the body at the mortuary).

Planning

The DVI Coordinator (or nominee), in conjunction with the head Pathologist, will coordinate:

- movement of bodies at the completion of the DVI function, to an area for the performing of post mortem,
- number of staff working within the Permanent Mortuary,
- operations of other specialists i.e. Odontologists.

Briefing

Depending upon the size, location and duration of the DVI operation, personnel acting as DVI team members at the disaster site, may not attend the permanent mortuary.

If this is the case, the DVI Coordinator must ensure that all DVI personnel under his/her control receive adequate and appropriate briefing instructions. (See **'Briefings for Personnel'**)

Team roles

At the permanent morgue a detailed examination of the body is made and the relevant sections of the DVI Form should be completed. In particular the following procedures should be carried out:

- **every** photograph taken of the body, or items recovered from the body, must depict the DVI reference number,
- complete and thorough examination must be made of the deceased to locate personnel affects and clothing,
- all jewellery and clothing items must be clearly photographed, labelled and packaged. A size chart should be included where appropriate.
- measurements of the body, build, colour of hair, deformities, abnormalities, scars, marks, tattoos, clothing labels and sizes etc. should be completely documented and photographed,
- results of examinations by specialists, such as pathologists and odontologists will be recorded in the appropriate sections of the DVI form,

Pathologists

For the majority of disaster incidents, the forensic pathologist will perform autopsies on deceased victims, however, if the incident has occurred due to transportation impact (i.e. Aircraft crash etc.), then the services of a specialist (i.e. Aviation pathologist) may be required. The photographer will assist the pathologist with photographing injuries to establish cause of death.

Also see Commissioner's Instruction number 62.22 (Mass fatalities).

Fingerprints

To assist in the identification process, personnel from the Fingerprint Unit may need to be deployed.

The response for fingerprint personnel must be initiated from/through the DVI coordinator.

Contact for these personnel during normal office hours can be made with the Commander of the Latent Fingerprint Crime Scene Unit, Ferguson Centre, Parramatta.

Contact outside normal office hours can be made through the District Operations Inspector (DOI).

Forensic Odontologist

Dental comparisons of disaster victims are made by comparing the teeth and restoration work of the deceased, as against a

known person's dental chart.

In the event of extensive burning or injury to deceased persons, contact should be made with a forensic odontologist in regards to the correct method of recovery of the teeth and mandible which may relate to that deceased person.

Dental records

It is the responsibility of the DVI Coordinator to assist in the obtaining of dental records for use by the Odontologists.

Uniform and/or plain clothes Police may be utilised in the collection of such records, for the conveyance to the Permanent Mortuary.

8.0 Collating victim information

Interviewers

Interview personnel come under the direct control of the DVI Permanent Morgue Coordinator (or nominee).

Personnel selected for this role should have a sound knowledge of interviewing techniques and receive adequate and appropriate briefing instructions prior to the commencement of interviewing duties.

Interviews should be conducted in a private location, preferably in separate rooms.

It is desirable and of benefit to the interviewer to have a trained welfare officer present during the interview. These officers can relieve the interviewer of the added problem of calming emotionally distressed interviewees.

Adequate rest periods should be given to interview personnel because of the mental and emotional aspects of the interviewing.

Interview personnel will:

- show consideration to interviewees,
- complete as many details as possible in the antemortem (yellow) section of the DVI form,
- complete one DVI antemortem information form per missing person report,
- when completing antemortem information on DVI forms, do not use descriptive terms such as, **'MEDIUM'** or

'AVERAGE', as these are of no value in the describing of physical features of missing persons,

- ensure that completed antemortem information forms are hand conveyed to the DVI Permanent Morgue Coordinator,

Visual identification

The most reliable primary evidence in the identification of disaster victims, comes from personal characteristics e.g. fingerprints and dental examinations.

Secondary evidence may arise from visual identification, the identification of clothing, documentation, jewellery and other personal items attached to the deceased.

The results of the DVI procedures at the scene and morgue will be married with information obtained from relatives.

If after comparing the antemortem (yellow section) and post mortem (pink sections) results of the DVI form, and a possible 'match' is found, arrangements can be made for the friend/relative of the victim to view part or all (if possible) of the deceased in order for a visual identification to take place.

Visual identification of victims may be acceptable in certain circumstances, however, it must be remembered that mistakes are more likely to occur with large numbers of deceased persons involved with disaster victim identification. Where possible other forms of identification should also be used.

The accepted and confirmed identification of a deceased disaster victim must only be made after a combination of primary and secondary evidence is obtained.

The DVI Coordinator should maintain close liaison with investigating police to assist in the identification of deceased persons.

9.0 Establishing identity

Coroner's responsibility

Ultimately it is the decision of the Coroner to determine if there is sufficient primary and secondary evidence and information to establish the positive identification of a deceased person.

Physical Evidence personnel are to present all necessary identification evidence before the Coroner as soon as possible and are to assist his office with any reasonable request.

10.0 Preparation and presentation of evidence

The presentation as to the cause and nature of the disaster should be presented depending on the type and nature of the scene eg, fire collision etc. (refer *General and Specific Investigations*)

The presentation of information in relation to the identification of deceased victims and the investigation arising from a 'Disaster' incident, must be performed in an accurate and professional manner.

The offered information must be presented in such a fashion as to allow persons, who had not attended the disaster scene, to have a clear understanding of the events involved. In view of this, the information must be presented in a logical sequence, supported with adequate and appropriate photographs of the scene, relevant exhibits, the position of victims in situ, and identifying aspects of the victims.

Presentation of information in relation to DVI operations should be prepared in book form showing:

- overall scene photographs or plans,
- photographs of victims including:
  - in situ - taken at scene,
  - full body length (clothed) - taken at permanent morgue,
  - full frontal of facial features (washed) - taken at permanent morgue,
  - identifiable articles or items - taken at permanent morgue,

The above colour photographs can be pasted onto thin cardboard accompanied with an information section in relation to that victim.

The information section should contain the following headings:

- DVI Reference number,

- name of the deceased,
- address of the deceased,
- age of the deceased,
- occupation of the deceased,
- where deceased was located at the disaster scene (optional),
- name of person (usually Police), who the deceased was identified to,
- name and address of the person who identified the deceased,
- relationship the identifying person had to the deceased ie. mother, father etc.

11.0 Debriefing

To be effective, an operational debriefing should be conducted as soon as possible after the completion of a DVI operation.

The debriefing process within a DVI operation takes two forms:

- operational debriefing,
- critical incident stress debriefing.

Operational debriefing

Regardless of the size or complexity of a DVI operation, an operational debrief should be conducted to accesses the effectiveness of:

- operating procedures,
- training,
- individual roles,

The debriefing officer should control the debrief and address specific issues such as:

- suitability of search methods,

- suitability of DVI procedures,
- effectiveness of communication system,
- identify strengths and weaknesses in the operation,
- other related issues,
- provide the results of the debrief to the Operations Coordinator.

Critical incident stress debriefing

A Critical Incident Stress debriefing should be conducted by members of the Police Psychology or Welfare Unit after 24 hours and within 72 hours, for all police who attended the disaster.

Appendix G-1

Equipment

Personal

Every Physical Evidence Officer at a disaster scene **must** wear appropriate protective clothing at the scene, including:

- overalls
- leather footwear
- hard hats
- gloves
- sun protection lotion/insect repellent
- specialised equipment, as required eg. breathing apparatus, contamination suits etc.

General

The minimum equipment required for DVI duties includes:

- cameras
- film
- rubber/latex gloves
- DVI forms
- pens
- writing paper
- DEAD tags
- SPECIMEN tags
- metal stakes or poles
- tape

Additional equipment which may be required includes:

- wet/cold weather clothing
- wide brimmed hats
- chairs and table
- lighting
- sleeping arrangements
- weather protection such as tarpaulins
- whiteboard and markers

A covered trailer containing DVI equipment is available from the Physical Evidence Section command.

Appendix G-2

Training

Training and Research Unit

The overall training responsibility of Physical Evidence personnel for DVI duties rests with the Section's Training and Research Unit.

Unit/Zone

The responsibility for DVI training of Physical Evidence personnel at a local level rests with the respective Zone Supervisors and Unit Leaders.

The Zone Supervisor must:

- liaise with Unit Leaders and conduct sufficient training sessions or exercises to enable all personnel under their control, to be fully conversant with DVI functions and procedures,
- conduct a minimum of two (2) DVI field training exercises, within their Zone, each year,
- ensure that their zone maintains existing DVI equipment and has a sufficient supply of equipment to perform DVI duties as required,
- ensure their personnel are included within any District disaster exercises,
- maintain a close liaison with volunteer or full time emergency services within their Patrols,
- ensure that other Police and associated services personnel within their locality are informed of the DVI role within disasters.