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## 1.0 Introduction

### 1.1 Scope

This Crime Scene Investigation Procedures Manual is for use by Michigan State Police (MSP) Forensic Science Division (FSD) Crime Scene Response Team (CSRT) personnel while performing their scene investigation duties at a crime scene.

A crime scene is generally considered to be the area, object, or person from which evidence is identified, documented, collected and/or analyzed. The area of a crime scene is only limited by the actions and distances covered by both offenders and victims. The crime scene is considered an extension of the laboratory.

The methods and procedures described are general guidelines and do not reflect all the variations and combinations of techniques that may be utilized at a crime scene. This manual should not be regarded as an all-inclusive procedure on crime scene processing. It is recognized that every crime scene is unique and as such may require variations in the documentation, collection and processing of the crime scene. Each crime scene is evaluated by the CSRT to develop a specific plan for documenting, processing and collection of evidence.

Throughout this manual crime scene response team (CSRT) and crime scene investigation (CSI) are used and should be considered the equivalent of the discipline of scene investigation.

### 1.2 Purpose

The purpose of this manual is to serve as a source of information for CSRT personnel on scene investigation procedures, evidence handling, and processing methods routinely utilized at the crime scene.

Every effort has been made to document the routine procedures used at crime scenes and to provide appropriate references. Many procedures have been adapted from standard laboratory practices and, therefore, no specific reference may be available.

*Deviations from these procedures are permitted but shall be thoroughly documented in the case record and approved by the CSRT Leader. If a specific deviation occurs frequently or is determined to be more successful than the standard method, the Technical Leader should be notified. A change and re-validation of the method that is being deviated from may be necessary.*

This manual in combination with the Crime Scene Training Manual provides the basis for effective quality management of MSP's crime scene response teams. The FSD's Quality Manual (QM), Laboratory Operations Manual (LOM), and Health and Safety Manual provide additional information that pertains to CSRT.

### 1.3 Goal

To provide the highest quality objective crime scene investigation and analysis to the criminal justice system throughout the State of Michigan on a 24-hour basis at no cost.

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The types of crimes commonly responded to include but are not limited to homicides, suspected homicides, suspicious deaths, excavations/exhumation, officer involved shootings and violent or serial assaults. Crime scene and vehicle processing requests for other serious crimes are evaluated on a case-by-case basis. Crime Scene Coordinators at each laboratory can consult with an investigating agency to help determine if a CSRT should be deployed.

## 1.4 Objectives

To deploy a CSRT to the crime scene when deemed necessary to:

- Document the crime scene
- Search and process the crime scene for forensic physical evidence
- Ensure the proper recognition, handling, collection and packaging of forensic physical evidence
- Perform specialty techniques (e.g., bloodstain pattern analysis, chemical processing and trajectory analysis) that aid in the location of evidence and reconstruction of the crime
- Issue laboratory reports detailing the response to the crime scene
- Provide digital images and documentation from the crime scene
- Provide courtroom testimony related to the CSRT's response

## 1.5 Quality Assurance

All crime scene analysts shall continually maintain the highest degree of ethics, quality, objectivity and integrity of laboratory services as it relates to crime scene investigation. All crime scene response personnel shall familiarize themselves with this manual, the QM, and the LOM and implement FSD quality assurance policies and procedures to their work.

CSRT's utilize their knowledge, skills and experience, as well as, information provided by the investigating agency to develop an objective plan to analyze and process the crime scene.

While performing duties as a crime scene analyst, personnel should:

- Be independent, impartial, detached and objective approaching the crime scene with due diligence and an open mind
- Conduct full and fair examinations and make decisions based on evidence, facts, training, knowledge, and experience and not on extraneous non-factual information, political pressure or other outside influences
- Communicate honestly with all parties
- Consider alternate hypotheses while performing duties related to crime scene investigation

### 1.5.1 Relationship with Person(s) Involved

Analysts shall not process crime scenes involving person(s) who they are knowingly related to or have a close relationship to. If person(s) involved are not known prior to and/or during the response and it is later determined there is a relationship to a person involved, it shall be documented in the case file and the analyst shall remove themselves from any further processing at the time of discovery of the relationship.

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### **1.5.2 Analyst(s) Absent from or Not Completing Casework for a Calendar Year**

Any analyst that has been away from work, has not responded to a crime scene, or has not authored a CSRT report for a calendar year shall notify the technical leader at the end of that calendar year via email. The technical leader shall re-evaluate that analyst and determine if retraining is necessary. Any analyst that has issued this type of email for two consecutive years shall be retrained. If retraining is necessary, the technical leader shall devise a retraining program specific for the analyst(s) and oversee its successful completion. A competency test shall also be completed at the conclusion of the retraining.

### **1.5.3 Method Validation**

New methods and modifications to established methods and procedures within this manual shall be validated according to the requirements of the LOM with approval from the Technical Leader or designee.

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## 2.0 Safety Precautions

Crime Scene Response Team members should be cognizant of the fact that crime scene analysis is often done in an uncontrolled environment. Dangers may be present in and around the crime scene from a myriad of sources. Every effort should be taken to create a safe environment to allow the CSRT to process the crime scene without incident.

The requesting/investigating agency shall:

- Clear the crime scene of suspects, hazards and any other potential sources of danger to CSRT personnel before the CSRT enters
- Be responsible for providing security at the crime scene including
  - Marked police presence and/or armed personnel over watching the crime scenes

In the event that security/protection is in question, the CSRT Leader or personnel can contact the nearest Michigan State Police Post, Dispatch or other facility to request available State Police personnel for protection and security. If security cannot be provided, the CSRT can suspend processing and depart the crime scene until security is available.

Crime scene response vehicles and/or CSRT personnel shall be properly equipped with necessary personal protective equipment (PPE) and other safety measures including but not limited to:

- Bullet resistant vests (individually assigned or shared)
- Cut/puncture resistant gloves
- Dust masks and/or surgical masks
- Face shields
- Hard hats
- High visibility vests Nitrile gloves
- Respirators
- Safety glasses and goggles
- Shoe/boot covers
- Tyvek type suits

Standard laboratory safety protocols should be followed whenever possible at crime scenes. Please refer to the FSD Health and Safety Manual for specific protocols.

The CSRT Leader (in consultation with the team) is responsible for evaluating the situation and crime scene to determine the appropriate level of PPE to be worn.

Crime scene analysts shall adhere to the following safety guidelines:

- Nitrile or other non-permeable gloves shall be worn when handling blood, bodies and biological evidence/materials and a surgical mask or respirator should be worn when collecting biological evidence
- Appropriate eye protection shall be worn whenever a hazard to the eyes exists. This includes but is not limited to chemical exposures, use of power tools and alternate light sources (UV, laser, etc.) and splash potential from blood/body fluids
- Avoid touching the face or other unprotected body areas with gloves
- Wash or sanitize unprotected body areas after any potential contamination
- No smoking, eating, or drinking in the immediate vicinity of the crime scene, except in designated safe areas
- Commercial laundering of fatigues or other department issued apparel

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- Decontamination of equipment used at the crime scene that has been contaminated or could cross contaminate the next time utilized
- Appropriate PPE (including a respirator) shall be worn when using hazardous chemicals

## 2.1 Incompatible activities

To prevent contamination at the crime scene, the appropriate PPE shall be utilized as necessary for the situation.

*To minimize cross-contamination, PPE and fatigues shall be changed or new PPE shall be employed when processing multiple crime scenes related to the same situation that could result in associative evidence being transferred from one location to another (e.g., processing the victim's residence and subsequently processing the suspect's vehicle or residence).*

## 2.2 Adverse Environmental Conditions

Crime scenes may be established anywhere and can be affected by a variety of environmental conditions and physical adversities. When possible, crime scenes and evidence should be protected from these conditions and adversities. When it is suspected that conditions could affect the validity of results of testing, processing and/or collection, it should be thoroughly documented. In these situations, if it is possible to change the conditions or perform the techniques at a more suitable location, every effort should be made to do so.

## 2.3 Decontamination

Personnel should make every effort to decontaminate themselves and their clothing at the conclusion of the crime scene to avoid transferring hazardous material to the crime scene response vehicle. Equipment that was utilized at the crime scene and has been contaminated or could cross contaminate the next time utilized shall be decontaminated with a ~10% bleach solution or other appropriate sanitizing cleaners/wipes and placed back on the CSRT vehicle.

## 2.4 Safety Responsibilities of Crime Scene Response Team Personnel

Each CSRT member is responsible for being aware of the hazards of the chemicals and materials they are using at the crime scene, and they are responsible for knowing how to safely handle them.

Each analyst is responsible to

- Wear the appropriate personal protective equipment and know when it is required
- Follow the safety procedures set forth in the Health and Safety Manual and this procedures manual

*Due to the inherent dangers and unexpected situations that may arise during an on-scene crime scene investigation, team members should wear available body armor while they are deployed to a crime scene.*

## 2.5 Critical Incident Stress/Trauma

Critical incident stress/trauma is a reality for all CSRT personnel due to their repeated direct exposure to critical incidents. CSRT personnel (and their management) should be cognizant of this fact and the symptoms associated with it to help maintain the mental health of themselves and their fellow CSRT personnel.

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All CSRT personnel are strongly encouraged to debrief with their fellow crime scene personnel and utilize the services provided by the Office of Behavioral Science (OBS).

Individual CSRT members should not hesitate to contact the OBS for any support needed with regards to their experiences and observations from crime scenes or any other situation where this type of service is needed (888-677-2999 or 517-334-7745). The OBS also offers a Peer Support program which provides one-on-one support during and after a personal crisis to help you learn to cope with stress through the guidance of a Peer Support Person (PSP). A PSP is a Michigan State Police employee who has completed intensive training through the OBS in the areas of communication, crisis management, stress management, relationship issues, substance abuse and confidentiality.

Laboratory directors, the crime scene technical leader and/or other laboratory management should consider requesting a representative from OBS to visit labs on a regular basis or after especially difficult crime scenes to help encourage personnel to utilize the service and help alleviate stress/trauma.

## 2.6 Fatigue

Fatigue is a message to the body to rest, and it is an ever-prevalent hazard for CSRT personnel to consider. Analysts routinely work long periods without rest, are awake for extended periods and are typically on their feet the majority of the time they are on-scene. They also tend to not take breaks; stay properly hydrated or well nourished. Driving the CSRT vehicles to/from the scene (which can be excessively far in some instances) and also driving home from the lab after a response are also areas a hazard from fatigue can present itself.

When CSRT personnel are excessively fatigued, they are not only a hazard to themselves and the investigation but can also be a danger to others around them.

The symptoms of fatigue, both mental and physical can vary from individual to individual but can include:

- Weariness
- Irritability
- Lack of concentration and memory
- Increased susceptibility to illness
- Headache
- Loss of appetite
- Sleepiness
- Reduced alertness
- Lack of motivation
- Depression
- Giddiness
- Digestive problems

*The management of fatigue is a shared responsibility between management and the individual. Each analyst has their own threshold for fatigue and analysts are ultimately responsible for taking breaks and notifying the CSRT leader that they need an extended break.*

At a minimum, the CSRT leader should remind the team members to take breaks every 2 to 4 hours to hydrate and eat away from the crime scene.

### 2.6.1 Maximum Work Time Limits

CSRT personnel should not work for more than 16 continuous hours (to include hours worked in the laboratory if the crime scene is a continuation of their work day and to include drive time) without taking a break of at least 2 hours or contacting the laboratory director or their designee to receive approval to continue working if the work can be completed within 4 hours. If approval is granted, *continuous work can continue up to a maximum of 24*

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*hours at which point a minimum break of 4 hours shall be taken or a new replacement team rotated in appropriately (for rotating in a new team see 2.6.2 below).*

CSRT personnel should not work after being awake for more than 24 continuous hours (this time limit includes drive time to their home) without approval from the laboratory director or their designee. *CSRT personnel shall not perform any crime scene duties and should not operate a motor vehicle after being awake for more than 28 continuous hours.*

In instances when a team is nearing the above max time thresholds, the CSRT leader evaluates the team and situation to either rotate in a new CSRT or have the investigating agency secure the scene, so the current team can take an extended break.

*Approval to work beyond limits, evaluation of the team by the CSRT leader, extended breaks, replacement with a new CSRT and other pertinent details related to the maximum work time limits shall be documented in the crime scene notes.*

It is the responsibility of each team member to inform the CSRT leader when they reach any of these maximum work time limits to ensure they do not exceed them.

When logistically feasible and authorization has been granted by the laboratory director (or their designee) or the CSRT has exceeded 16 hours of continuous work hours, team members are encouraged to obtain lodging locally to take their extended break and/or sleep.

An extended break should allow sufficient time for the team members to recover and be able to confidently continue their duties at the crime scene. The time and conditions of the extended break are left to the discretion of the CSRT leader and team members.

## **2.6.2 Rotating in a New CSRT**

When a new team is to be rotated in the initial CSRT leader or their designee shall brief the replacement team and the new CSRT leader, as well as, remain available for a period of time to answer questions and effectively transfer the crime scene to the new team.

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### 3.0 CSRT Personnel

Crime scene response team members fall under one or more of the following categories. The organizational chart for the discipline of crime scene can be found at the end of this section.

#### 3.1 CSRT Liaison

A crime scene analyst selected by the laboratory director or their designee to oversee the discipline of crime scene at the laboratory. The CSRT Liaison reports to the laboratory director for crime scene related matters.

##### 3.1.1 CSRT Liaison Responsibilities

Each laboratory shall have a designated CSRT Liaison who is responsible for:

- Attending CSRT Liaison meetings with the crime scene technical leader
- Updating the laboratory director on the content of CSRT Liaison meetings
- Dissemination of information from these meetings to the crime scene personnel at the laboratory
- Additional responsibilities may be added at the discretion of the laboratory director and/or technical leader

#### 3.2 Crime Scene Analyst (CSA)

Forensic Scientists, State Police Specialists and Laboratory Managers that have been trained to competency and authorized to conduct casework in the discipline of crime scene investigation. CSA's are authorized to perform all aspects of crime scene search, documentation, testing/processing, evidence collection, report writing and reviews.

#### 3.3 Crime Scene Technician (CST)

Forensic Technicians that have been trained to competency and authorized to conduct casework in the discipline of crime scene investigation. CST's are authorized to perform all aspects of crime scene search, documentation, testing/processing, evidence collection and CSRT final reviews.

*CSTE's are not authorized to author or technically review crime scene reports.*

#### 3.4 Crime Scene Trainee (CSTE)

An FSD employee that is or will be entering the CSRT training program and is at the crime scene for observation/learning purposes. CSTE's should only perform non-technical duties (e.g., transporting equipment, holding equipment, recording dictated notes, etc.) and/or work under the supervision of CSA's to perform technical duties (e.g., recording notes, sketching, photography, searching, processing, etc.)

*CSTE's are not authorized to author or technically review crime scene reports.*

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### 3.5 CSRT Response Coordinator

An FSD employee (preferably a Crime Scene Analyst), the Laboratory Director or their designee that fields requests for CSRT's. This person should be able to communicate effectively and ask the necessary questions to evaluate the request and determine if a response is necessary. The CSRT Response Coordinator reports to the Laboratory Director for crime scene related matters.

The CSRT Response Coordinator is identified on the FSD-068.

#### 3.5.1 CSRT Response Coordinator Responsibilities

The CSRT Response Coordinator is responsible for:

- Fielding calls from agencies requesting assistance
- Obtaining relevant case information from the requesting agency and recording it on the FSD-068
- Evaluating the request and determining if a response is warranted
- Notifying the laboratory director or their designee if a response is deemed unnecessary

If a response is deemed necessary, the CSRT Response Coordinator is responsible for:

- Deploying a CSRT Consultant if necessary
- Contacting MSP Operations to notify a response team will be sent
- Contacting appropriate CSRT personnel and assembling the team
- Appointing a CSRT Leader
- Providing case details and information to at least one member of the CSRT (preferably the CSRT Leader)
- Fielding additional calls from the requesting agency and keeping them updated until the CSRT Consultant or CSRT arrives at the scene
- Providing the FSD-068 to the CSRT Leader for the team after the coordinator has completed their portion of it

### 3.6 CSRT Consultant

A representative of the FSD that may be deployed to the crime scene as expeditiously as possible while observing non-emergency driving rules. The intention of this position is to provide the quickest response and have an FSD employee on-scene, but not to necessarily start processing the crime scene.

*For expedited responses, the CSRT First Responder may replace the CSRT Consultant.*

#### 3.6.1 CSRT Consultant Responsibilities

Their responsibilities include but are not limited to:

- Responding to the crime scene as expeditiously as possible
- Consulting with the lead investigator or their representative
- Provide guidance to the investigating agency once on-scene
- Evaluate the crime scene for planning and logistics
- Relay relevant information to the CSRT Coordinator and/or CSRT Leader that is responding
- Request additional MSP assets (specialty equipment, specialty personnel, etc.)

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When the CSRT Consultant is a CSA or CST:

- Start the crime scene process if equipment is available
- When necessary, become part of the CSRT and assist in processing the crime scene

*When responding to areas deemed too dangerous, the CSRT Consultant can request a marked vehicle from the investigating agency or a nearby MSP Post to meet at another location and escort them to the crime scene.*

The CSRT Consultant and their departure/arrival times should be logged on the FSD-068.

### 3.6.2 CSRT First Responder

A CSA that responds to an expedited response crime scene prior to a CSRT. This analyst safely responds to the scene as efficiently as possible to start the crime scene process prior to the arrival of the rest of the CSRT. The CSRT First Responder may also act as or substitute for the CSRT Consultant. Their responsibilities can be found above in the CSRT Consultant responsibilities.

### 3.7 CSRT Leader

A CSA or CST that is in charge of the crime scene response team while they are out of the laboratory. The CSRT Leader is appointed by the CSRT Response Coordinator or as a collective decision by the CSRT personnel responding to the crime scene. The CSRT Leader reports to the laboratory director for crime scene related matters during the response.

*CSRT personnel on scene shall consider the CSRT Leader their supervisor until the team has returned to the laboratory and all crime scene duties back at the lab have been completed.*

The CSRT Leader for a response is identified on the FS-37.

#### 3.7.1 CSRT Leader Responsibilities

The CSRT Leader or their designee (from the CSRT) is responsible for all requirements of the CSRT while out of the lab as dictated by this procedure manual including, but not limited to:

- Assigning duties to team members
- Contacting MSP Operations
- Contacting and communicating with the lead investigator(s)
- Conducting a pre-scene and post-scene briefing
- Providing FSD-040 (crime scene response team evaluation) to the investigating agency
- Identifying and coordinating other MSP services or equipment
- Assessing scene security and communicating any concerns to the requesting agency(s)
- Ensuring chain of custody for all evidence collected by the CSRT
- Ensuring evidence is properly marked and packaged
- Providing a list of evidence collected to the requesting agency(s) when it is requested
- Obtaining permission to consume evidence
- Conducting a final walk through of the crime scene to confirm no evidence or equipment remains
- Ensure all duties are completed upon return to the laboratory
- Providing completed FSD-068 to the Technical Leader
- Appoint CSRT Case Coordinator for the crime scene

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### 3.8 CSRT Case Coordinator

A CSA that oversees the submission/case record for the crime scene after the CSRT Leader's responsibilities are completed back at the laboratory and until the crime scene report is released. This person is also the author of the crime scene report. The CSRT Case Coordinator reports to the laboratory director for crime scene related matters related to the submission/case record.

The CSRT Case Coordinator is identified on the FS-37 and within Forensic Advantage as the analyst the case record is assigned to.

#### 3.8.1 CSRT Case Coordinator Responsibilities

The CSRT Case Coordinator or their designee is responsible for all requirements as dictated by this procedures manual in reference to the case submission/record including, but not limited to:

- Communication with the investigating agency as necessary
- Uploading digital images to the Digital Crime Scene Repository (DCSR)
- Creation of submissions for laboratory analysis of evidence collected from the crime scene
- Creation of evidence within Forensic Advantage
- Distribution of this evidence to laboratory units
- Uploading and approving required documents to the object repository for the crime scene case record
- Ensuring the technical/administrative review of report is assigned and completed
- Ensuring CSRT final review(s) of the report are assigned to and completed by each of the team members
- Releasing report

### 3.9 Discipline Expert

A Forensic Scientist, State Police Specialist or other recognized expert who may or may not have been through any CSRT training, but who has a specific expertise beyond the scope/training of the CSA's present at the crime scene and is authorized to conduct casework within a specific discipline in the laboratory. Examples include but are not limited to bloodstain pattern analysis, chemical testing/processing, trajectory analysis, forensic anthropology, difficult/complex processing/collection or another type of technique the Discipline Expert has expertise in. Personnel in this category may only perform processing/testing/collection techniques within their area of laboratory expertise under supervision of a CSA or CST.

*Discipline Experts are not authorized to author or technically review crime scene reports.*

### 3.10 Other MSP Services

Other Michigan State Police services outside of the Forensic Science Division may be needed to assist an FSD CSRT when specialized equipment/expertise is needed. A list of other MSP services can be found in Appendix C of this manual.

The CSRT Leader, investigating agency and MSP services personnel work together to:

- Determine the role of the other MSP services personnel
- Identify any requirements outside the normal services provided by the other MSP services personnel
- Gain approval from the investigating agency for the use of the other MSP service

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These other MSP service personnel shall be identified on the FS-37 to include the name(s) of the personnel, their determined role(s), any requirements outside of the normal service provided and approval for their use by the investigating agency.

These MSP services from outside of FSD shall be appropriately trained and competent per their bureau's and/or division's policies.

*When other MSP services are utilized, it is the responsibility of the MSP service personnel to provide resulting documentation and reports to the investigating agency.*

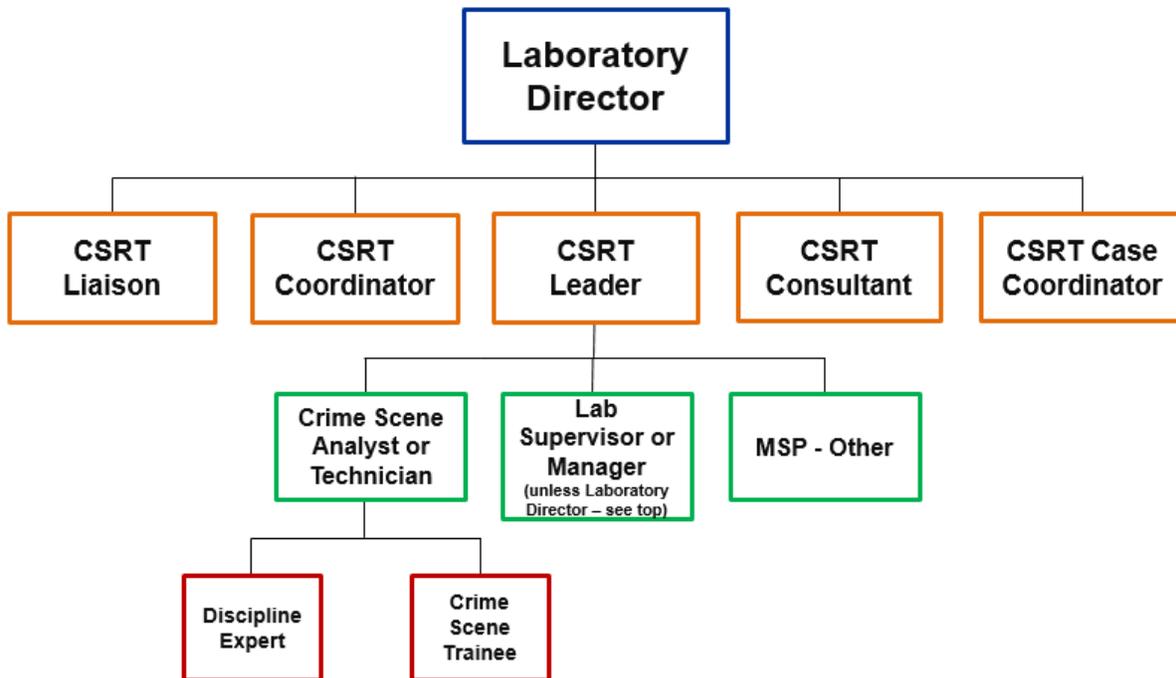
### 3.10.1 Evaluation of MSP Services

If an MSP service from outside FSD fails to fulfill their role at the crime scene or the service they provide is unsatisfactory to the CSRT Leader, the CSRT shall contact the crime scene technical leader after the response. The CSRT Technical Leader will investigate the situation and work with the MSP service to resolve the situation.

### 3.11 Crime Scene Organizational Chart

Below is the organizational chart for the discipline of crime scene investigation. Mass fatality incidents may require a separate organizational chart depending on the nature of the situation and lead agency. See Section 28.0 Mass Fatality Incidents for further details on the organizational structure at crime scenes deemed mass fatality incidents.

## Organizational Chart Discipline: Crime Scene Investigation



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## 4.0 Equipment and Products

Crime scene response requires a wide variety of equipment and products that need to be fully functioning and ready to operate reliably when needed. The majority of the equipment and products should be present on the CSRT vehicle at all times. Some equipment and products may need to be stored in the laboratory due to space limitations and/or environmental requirements.

*Equipment and non-consumable products that were utilized at the crime scene and could have been contaminated or could cross contaminate the next time utilized shall be decontaminated with ~10% bleach or other appropriate disinfectant (e.g., sprays, wipes, etc.) prior to being put back into service.*

*Consumable products and/or one-time use equipment utilized at the crime scene should be discarded.*

### 4.0.1 Calibration

No CSRT equipment requires calibration.

### 4.0.2 Critical Consumables

Critical consumables used for CSRT are obtained from laboratory units and noted in the case file documentation as directed by section 5.0 of this manual.

### 4.0.3 Externally Provided Products

CSRT products vary greatly from laboratory supplies to crime scene supplies to tools and power tools. Except for those listed below, any vendor can be used to purchase externally provided products with preference toward those on contract with the State of Michigan.

- Digital SLR cameras and components: Canon
- Metal detectors: Garret
- Chemicals and reagents: from laboratory units

## 4.1 Instructions for Use

Instructions for use and/or user's manuals for equipment listed in section 4.4 and other relevant equipment with user's manuals shall be stored digitally on the CSRT laptop for access by CSRT personnel.

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## 4.2 Basic Equipment and Products List

The following equipment and product lists are most commonly necessary for crime scene response, but not all equipment/products below are necessary for every crime scene. Additional equipment/products may be necessary or preferred and is left up to the discretion of the laboratory director or their designee. These equipment and products are exempt from the requirements contained within Sections 4.4 and 4.5 below.

Barrier tape	Ladder(s)	
Batteries	Lighting equipment	
Biohazard containers & labels	Measuring devices	
Cutting tools	Office supplies	
Digital cameras and accessories	Portable shelter	
Disinfectant/sanitizer	Power tools	
Evidence containers	PPE (see Section 2.0)	
Evidence markers	Rain/weather protective garments	
Excavation equipment	Rulers/scales	
Extension cords	Tape	
First aid kit	Tarps	
Hand tools		

## 4.3 Discipline Specific Kits and Go-Kit

Discipline specific kits and/or supplies shall be maintained on the CSRT vehicle for Biology, Bloodstain Pattern Analysis, Firearms, Entomology, Latent Prints, and Trace/Footwear/Tire Tracks. These kits shall contain the necessary equipment and products to perform tasks detailed in the discipline sections of the CSRT procedures manual.

A Go-Kit shall also be maintained on the CSRT vehicle or another area accessible to crime scene personnel. The Go-Kit should contain the necessary equipment and products to properly document and collect typical evidence that may be lost prior to the arrival of the CSRT and/or CSRT vehicle.

## 4.4 Equipment and Products Requiring Maintenance, Inspection and/or Evaluation

### 4.4.1 Equipment Requiring Maintenance and Checks

The equipment listed below shall be uniquely identified with the following designation "CSRT" followed by a dash followed by the two-letter lab identifier (e.g., BP for Bridgeport Laboratory) followed by a dash followed by a sequential number (e.g., a piece of equipment at the Bridgeport Laboratory would be uniquely identified as CSRT-BP-1). Additionally, this equipment shall be documented in the CSRT equipment log and requires maintenance and inspections as detailed below.

Other equipment and products can be given a unique identifier and added to the CSRT equipment log as described above at the discretion of the laboratory director or their designee.

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*The CSRT Technical Leader should be consulted prior to purchasing new equipment that may need to be maintained and inspected.*

CSRT mobile digital devices (e.g., tablets, iPad, etc. with associated software/applications) Digital cameras <ul style="list-style-type: none"> <li>• Lenses</li> <li>• External flash</li> </ul> Digital microscopes Digital thermometer(s)	Electrostatic lifting device Forensic/Alternate light source(s) Inspection camera (bore scope) Laser measurement device(s) Metal detector(s)
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#### 4.4.1.1 New Equipment Checks

Before being placed into service, new equipment detailed above shall be checked to establish that it meets the specific requirements necessary for its use at a crime scene, uniquely identified and entered into the “New Equipment-Product” tab of the CSRT equipment log. The CSRT Technical Leader should be consulted to determine an appropriate check for this type of new equipment before being placed into service.

#### 4.4.1.2 Rulers for Examination Quality (EQ) Photography

New rulers used in EQ photography shall be checked with a ruler that has a certificate of calibration prior to being placed into service and an entry made in the “New Equipment-Product” tab of the CSRT equipment log. The serial number or other identifier of the metal ruler with certificate of calibration shall be recorded with the entry in the equipment log. The tolerance for being approved for use is 0.5mm over the length of the ruler. Rulers that pass this check shall be marked with a label that includes a unique equipment designator of the two-letter lab identifier (e.g., BP) followed by a dash followed by “EQ” followed by a dash and a number (e.g. BP-EQ-1) which signifies it has passed the check and can be used for EQ photography.

Rulers approved and labeled for EQ photography in the laboratory are also acceptable for use at crime scenes.

#### 4.4.2 Equipment and Product Inspections

The equipment listed in section 4.4.1 above and additional equipment and/or kits below shall be inspected monthly by the laboratory director’s designee(s) and logged appropriately in the “Monthly Inspection” tab of the laboratory’s CSRT equipment log. Any other equipment/products the lab director or their designee deem necessary to be inspected monthly shall be included on the monthly inspection spreadsheet. The inspection should include confirming the equipment/product is present, stocked appropriately, has not expired, and is in good working condition. It shall also include starting and running gas powered equipment to confirm they start and are in working condition.

Products with expiration dates CSRT Vehicle Discipline specific kits Entomology kit Gas powered tools/equipment Generators	Go-Kit Trajectory laser(s) Rechargeable Area Lighting PPE
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#### 4.4.2.1 Expiration Dates

Medical equipment (e.g., scalpels, swabs, gloves, etc.) with expiration dates can be used past the expiration date but should be evaluated prior to use as described below in 4.4.3. Liquids, chemicals and other similar products with an expiration date should be discarded once expired or properly marked “for training” and removed from the CSRT vehicle and storage areas.

#### 4.4.3 Equipment and Products Requiring Evaluation

The following products shall be evaluated prior to use at the crime scene. The analyst at the crime scene shall evaluate products listed below by visual examination, control testing or other appropriate means prior to use. If it appears defective in any way, it shall be discarded, or performance tested on a non-evidence sample prior to use on evidence. If a performance test indicates it is defective, it shall be removed from service and not used on the evidence sample. If it fails a control test, it shall not be used on evidence samples. If no additional product of this type is available, the analyst should utilize an appropriate substitute technique, request product from laboratory stock or from another laboratory’s CSRT. The details of the evaluation shall be documented in the notes.

Upon return to the laboratory, any product(s) that was deemed defective shall be removed from the CSRT vehicle and discarded (if not previously discarded at the crime scene). The situation should also be entered into the “Damage-Repair” tab of the CSRT equipment log. The defective product should be replaced from the CSRT supply at the lab if available. If there is no additional product available, the laboratory director (or their designee) should be notified, so that it can be ordered and restocked as soon as possible. The laboratory director may also direct CSRT personnel to retrieve replacement product from the appropriate laboratory unit until new replacement product is received.

Angle Finder(s) Casting material <ul style="list-style-type: none"> <li>• Accutrans or Mikrosil</li> <li>• Dental Stone</li> </ul> Chemical processing supplies <ul style="list-style-type: none"> <li>• LCV ingredients</li> <li>• Luminol ingredients</li> <li>• Mixing bottles</li> <li>• Spray bottles/devices</li> </ul> Electrostatic lifting film	EQ Rulers/Scales Fingerprint elimination kit Fingerprint brush(es) Fingerprint powder(s) Gelatin lifters Handprints Tape <ul style="list-style-type: none"> <li>• Lifting</li> <li>• Book</li> </ul> Trajectory rods
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#### 4.5 Damage and Maintenance of Equipment

Maintenance of equipment from section 4.4 is performed as necessary and documented in the “Maintenance” tab of the CSRT equipment log. If a piece of equipment fails a performance check, gives questionable results, is shown to be defective or is significantly damaged, it shall be immediately taken out of service, isolated and clearly labeled "Out of Service" or simply removed from the CSRT vehicle. When this occurs at a crime scene, it shall be documented in the notes and logged in the CSRT equipment log upon return to the laboratory.

If maintenance/repair is not possible for a piece of equipment, it should be discarded and replaced. Details of the equipment issue(s) is documented in the “Damage-Maintenance” tab of the CSRT equipment log upon return to the laboratory and the laboratory director or their designee notified. Equipment that is out of service and does not

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have a backup piece of equipment shall be repaired or replaced as soon as possible. All other equipment is repaired or replaced at the laboratory director's discretion.

## 4.6 Equipment Outside Direct Control

If equipment goes outside direct control of the laboratory, it shall be documented in the "Outside Direct Control" tab of the CSRT equipment log. Upon return, the equipment shall be checked to ensure that it still meets the specific requirements necessary for its use at a crime scene prior to being returned to service. This check is also documented in the "Outside Direct Control" tab of the CSRT equipment log. If the piece of equipment does not still meet the specific requirements necessary for use, refer to section 4.4.2 above for guidance.

## 4.7 Unavailable Equipment and Products

In the event that specific equipment or product is not available for a period of time, the laboratory director or their designee shall formulate a contingency plan in the event that this equipment is needed while it is unavailable. The laboratory director or their designee shall also notify all CSRT personnel about the absence of the equipment and the contingency plan.

The absence of equipment should also be posted in the CSRT vehicle (e.g., whiteboard or a sign) until it is returned/restocked for service.

## 4.8 CSRT Vehicle

The use and maintenance of the CSRT vehicle shall comply with Official Order Number 10.

### 4.8.1 Extended Absence of CSRT Vehicle

In the event that a CSRT vehicle is out of service for an extended period of time, the laboratory director or their designee shall formulate a contingency plan for response to crime scenes. The laboratory director or their designee shall also notify FSD commanders, FSD laboratory directors, the crime scene technical leader and their laboratory CSRT personnel about the absence of the vehicle, the contingency plan and when the CSRT vehicle is returned to service.

## 4.9 Software, Applications and Automated Documents

All software, applications, and automated spreadsheets/worksheets utilized within crime scene investigation shall be validated prior to use unless previously validated under specific laboratory disciplines. The validation shall be approved by the crime scene technical leader. New software, applications or automated documents that have been validated are logged in the "New Equipment Check" tab of the CSRT equipment log prior to use at a crime scene.

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## 5.0 Chemicals and Reagents

Chemicals and reagents utilized for testing and processing at the crime scene shall be obtained from the appropriate unit within the laboratory. The containers of chemicals/reagents shall be minimally labeled with the identity of the chemical/reagent and a lot number or the date prepared.

All chemicals and reagents must be traceable by lot number or other means back to the original lot number of all the components. This can be achieved by laboratory reagent logs, lot numbers that electronically link back, or documentation of the original lot numbers at the crime scene (recorded in the notes or thru a digital image).

Examples:

- Phenolphthalein (prepared in the lab): Container will be labeled with a lot number that links back thru laboratory records to the original lots of the components and the person who made and tested the original reagent
- LCV (mixed on scene): Packets/bottles containing dry chemical components must have the manufacturer's lot numbers of these components recorded on the packets/bottles and they must be documented in the notes or a digital image taken of the packet/bottle showing the lot numbers

Reagents utilized at the crime scene shall be documented in the notes utilizing the reagent control sheets of the FS-37. All fields associated to the reagent on this form shall be filled out (the notes field at the bottom of the page are not required to be used). The person(s) performing the testing and control testing shall also be documented in the appropriate field(s). Checking the box for "QA/QC passed" indicates the positive and negative control tests were successful.

Reagents prepared at the crime scene shall be discarded after the crime scene response unless being used back at the laboratory for training or further processing.

Areas processed/tested, the reagent used, and the results of the processing/testing shall be detailed in the notes.

The following table is provided to determine which reagents typically used at the crime scene are purchased premixed, prepared in the lab or prepared at the crime scene.

<b>Purchased Premixed</b>	<b>Prepared in the Lab</b>	<b>Prepared at the Crime Scene</b>
ABAcad® HemaTrace®	Acid Phosphatase	Leucocrystal Violet
Hemastix	Tetramethylbenzidine	Luminol
	Phenolphthalein	Sodium Rhodizonate

## 5.1 Reporting for Areas Tested and/or Processed During the Bloodstain Pattern Analysis

When reporting results, analysts shall report the following:

- Reagent used
- Area(s) tested
- Test result(s) and what it indicates (including negative testing results for areas tested)

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For example:

- The red-brown stain on the kitchen counter near the sink (L-5) tested phenolphthalein positive indicating the possible presence of blood.
- Impact site C tested sodium rhodizonate positive indicating the possible presence of lead.
- The east bedroom floor was processed with leucocrystal violet, and multiple footwear impressions (A-D) developed indicating the possible presence of blood.
- The vehicle trunk was processed with luminol with two areas (L-2 and L-3) of luminescence detected indicating the possible presence of blood.

Additional testing results and wording can be found in the Biology Procedures Manual.

## **5.2 Reagent Preparation and Application**

### **5.2.1 Acid Phosphatase (AP)**

Please refer to the Biology Procedures Manual, Semen and Seminal Fluid Detection section.

### **5.2.2 Hemastix®**

Please refer to the Biology Procedures Manual, Blood Detection section.

### **5.2.3 ONESTEP ABACard® Hematrace®**

Please refer to the Biology Procedures Manual, Blood Detection section.

### **5.2.4 Leucocrystal Violet (LCV)**

LCV is a processing reagent (and presumptive test) that contains a fixative and can be used to locate latent blood and/or enhance/develop bloody impression evidence (to include latent prints) and bloodstain patterns. LCV is the reduced (colorless) form of crystal violet. When LCV and hydrogen peroxide come into contact with the hemoglobin in blood, an oxidation reaction catalyzed by the peroxidase-like activity of the hemoglobin occurs, resulting in a dark violet color.

#### **5.2.4.1 Equipment/Materials**

- Mixing bottle capable of holding the volume of reagent being mixed
- Aerosol or pump spray bottle/device, squeeze/squirt bottle or large container to immerse substrate into
- Deionized or distilled water for rinsing
- Paper towel (or similar absorbent material)
- Positive control

#### **5.2.4.2 Ingredients**

- 500 milliliters of 3% hydrogen peroxide
- 10 grams of 5-sulfosalicylic acid
- 4.4 grams of sodium acetate
- 1.1 grams of leucocrystal violet

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### 5.2.4.3 Mixing

1. Add the 5-sulfosalicylic acid to the hydrogen peroxide and shake to dissolve
2. Add the sodium acetate and leucocrystal violet to the above solution (hydrogen peroxide and 5-sulfosalicylic acid) and shake to dissolve

### 5.2.4.4 Application Process

*When spraying LCV, a respirator should be worn by personnel in the room/area being treated.*

#### 5.2.4.4.1 Searching for Latent Blood and/or Latent Bloodstain Patterns

1. Spray surfaces with a fine mist
2. Allow approximately 60 seconds for the reaction to take place
  - a. If deemed necessary, additional LCV can be applied to positive areas for further development of bloodstain patterns
3. If necessary, spray or wash the area with water to remove excess reagent
4. Document areas that develop and photograph

#### 5.2.4.4.2 Processing for Impression Evidence

1. Spray surfaces with a fine mist
  - a. If deemed necessary, objects/surfaces can also be immersed in reagent or rinsed with reagent from squeeze bottle
2. Allow approximately 60 seconds for the reaction to take place
  - a. If deemed necessary, additional LCV can be applied to positive areas for further development of bloodstain patterns
3. Spray or wash the area with water to remove excess reagent
4. Carefully blot water and reagent away with a paper towel or other absorbent material
5. Document areas that develop impression evidence and EQ photograph

#### 5.2.4.4.3 Alternative Application Process for Vertical Surfaces

1. Affix a smooth, non-textured paper towel or similar absorbent material over the surface to be treated
2. Spray or saturate the paper towel making sure the towel is making contact with the entire surface (no air bubbles)
3. Allow it to react for approximately 60 seconds and then remove the paper towel
4. The surface can be rinsed with water if necessary
5. Allow surface to air dry or carefully blot water and reagent away with a paper towel or other absorbent material

### 5.2.4.5 Results

- Positive: Development of violet color within 60 seconds
- Negative: No color development
- Inconclusive: Development of a color other than that specified or a failure of the control(s)

### 5.2.5 Luminol

Please refer to the Biology Procedures Manual, Blood Detection section.

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*Luminol does not contain a fixing agent. Therefore, it should only be used for impressions on absorbent surfaces where other reagents would not enhance the visibility of the impressions.*

## 5.2.6 Phenolphthalein

Please refer to the Biology Procedures Manual, Blood Detection section.

## 5.2.7 Sodium Rhodizonate

Sodium rhodizonate is a chemically specific chromophoric test for the presence of lead (vaporous, particulate, wipe). Prior to application it is advised to test a small area of the background/substrate with the solution as described below to confirm it does not react. If it does, another chemical processing technique should be utilized if available.

The buffer, hydrochloric acid and acetic acid solutions and the lead standard shall be obtained from the Firearms Unit within the laboratory.

*Do not perform this test on an item if the item needs to be processed for distance determination where a Griess test or DTO test should be performed first.*

### 5.2.7.1 Equipment/Materials

- Aerosol or pump/squirt spray bottles
- Lead standard (from Firearms Unit in the laboratory)
- Filter paper (i.e. Benchkote)
- Sterile swabs
- Sodium rhodizonate
- Deionized or distilled water
- Buffer solution
- 5 % Hydrochloric acid solution
- 15% Acetic acid solution

### 5.2.7.2 Mixing

1. Add sodium rhodizonate to distilled/deionized water until the solution is a dark orange color

*The solution should be used within an hour or it may be ineffective.*

### 5.2.7.3 Direct Application Method

1. Spray the area to be tested directly with the sodium rhodizonate solution
2. Spray the same area with buffer solution
  - a. A pink reaction may be visible at this point which is presumptive for lead or other heavy metals
3. Spray the same area with the hydrochloric acid solution
  - a. A blue-violet color confirms the presence of lead

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## 5.2.7.4 Transfer Method

### 5.2.7.4.1 Filter Paper

1. Dampen filter paper with acetic acid solution
2. Press and hold filter paper against the hole or area to be tested for approximately one minute
3. Remove filter paper and apply sodium rhodizonate solution
4. Spray the filter paper following steps 2 and 3 above in the Direct Application Method

### 5.2.7.4.2 Swab

1. Dampen swab with acetic acid solution and gently swab the area in question
2. Apply sodium rhodizonate to the swab
3. Spray the filter paper following steps 2 and 3 above in the Direct Application Method

## 5.2.7.5 Results

Positive result: Pink color presumptive for lead (no HCL application); Blue-violet color confirms lead (with HCL application)

Negative result: No color development

Inconclusive result: Development of a color other than that specified for a positive or negative result or failure of the controls

## 5.2.8 Tetramethylbenzidine (TMB)

Please refer to the Biology Procedures Manual, Blood Detection section.

## 5.2.9 Other Chemicals/Reagents

Other processing/testing reagents utilized in the laboratory exist that may be utilized at a crime scene. It is left to the discretion of the analyst responsible for the evidence type at the crime scene to determine if one of these other chemical processing techniques should be used at the crime scene. When using other reagents at the crime scene, documentation and reporting requirements still apply. Please refer to and follow the applicable instructions in discipline specific laboratory procedures manuals when employing other reagents at the crime scene.

## 5.3 Reagent Log

A reagent log is not maintained for crime scene because all reagents used are documented in the notes as described above and obtained from laboratory units.

## 5.4 Processing Reagent/Chemical SDS

When a reagent/chemical is used in abundance at the crime scene on surfaces (walls, floors, etc.) that is accessible to people after the crime scene is released, the "SDS Summary for CSRT Reagent" sheet should be provided to the investigating agency to be left at the scene. The SDS summary sheet can be found in the "CSRT Documents" folder of the Crime Scene Response Team Discipline Specific Space on Qualtrax.

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## 6.0 Requests for a CSRT

A laboratory CSRT is assembled and deployed when the crime scene involves forensic evidence collection that exceeds the agency's investigators and/or crime scene investigators.

If a CSRT is deployed, it is an indication that the laboratory has the capability and resources to process the crime scene, and the CSRT shall select and use the most appropriate procedure(s) that meet the investigating agencies request.

### 6.1 Classification of Response

CSRT Response Coordinators evaluate requests and classify the type of response necessary to help determine the resources that are deployed. Responses are typically classified as:

- Expedited: A first responder or consultant deployed to get CSRT presence on scene as soon as possible followed by a CSRT
- Full: A CSRT assembled and deployed as soon as possible
- Scheduled: Response to be scheduled for a CSRT to respond at an agreed upon date/time
- Partial: Nature of the crime scene and/or size/experience/personnel of the requesting agency only necessitate a partial CSRT assistance with a specialized technique (these types of responses are discouraged, and it is preferred to deploy a full team to process the entire scene)

The CSRT Response Coordinator shall document the details of the request for inclusion on the FSD-068.

#### 6.1.1 Unusual & Mass Fatality Incident Requests

When the CSRT Response Coordinator receives a request he/she deems to be unusual, high profile or extremely sensitive in nature or could be classified as a mass fatality incident, the laboratory director shall be contacted and notification of the situation passed up the chain of command to division commanders.

#### 6.1.2 Non-Response

Some requests for a CSRT may be denied due to the nature of the request or may not require a response because the requesting agency only requires a consultation. When a response request is denied, it shall be documented and forwarded to the technical leader for inclusion on the statewide CSRT spreadsheet.

Consultations do not require notification to the technical leader.

## 6.2 Reducing Response Time

To expedite our responses, innovative ideas that are appropriate for their CSRT coverage area can be employed. The variety of coverage areas for our laboratories and number of CSRT personnel available for crime scene response may dictate how different classifications of response are handled and which suggestions below are applicable. Additional ideas may also be employed at each laboratory

- Mass text messaging to all CSRT's when a response is necessary
- Utilization of hybrid team members from other laboratories

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- Hybrid Team Members are those that don't work at the laboratory being requested, but live in region assigned to this laboratory
- Take home State cars, go-kit and attire for personnel willing to respond directly to the crime scene from home
- CSRT Response Coordinator does not respond to the crime scene they are coordinating

### 6.3 Communication with the Requesting Agency

The CSRT Response Coordinator or the CSRT Leader selected for the crime scene response should contact the requesting agency at some point after a team has been assembled to provide an estimated time of arrival (ETA). The CSRT Leader should also consider providing the requesting agency with updates on ETA in situations where the crime scene is a significant distance from the laboratory or the CSRT is delayed for some reason.

Communication between the CSRT Leader and the requesting agency is crucial in all cases a CSRT is deployed and should be continual throughout the response.

### 6.4 Expectations of Requesting Agency

The agency requesting an MSP CSRT is expected to:

- *Clear the scene of potential hazards and ensure that it is secure and safe prior to the arrival of the CSRT*
- *Provide at least one uniformed officer and marked vehicle for crime scene security for the duration of processing the crime scene by the CSRT unless the CSRT leader deems this not necessary*
- Have personnel on-scene to provide detailed information about the crime scene in question
- Have a valid and accurate search warrant or consent to search in hand, be in the process of obtaining one, or have contacted the prosecutor to determine that a search warrant is not needed
- Protect evidence that may be affected by adverse weather conditions
- If necessary, photograph and/or collect evidence which is in danger of destruction by adverse weather or by virtue of its location and nature could be dangerous to personnel on scene (weapons or other items accessible to the public)
- Whenever possible, photograph and mark any item that is collected or moved prior to laboratory CSRT's arrival
- Have a point of contact on scene or readily available via another means of communication for the CSRT leader throughout the processing of the crime scene
- Provide elimination finger and palm prints and elimination DNA swabs of persons involved or that have entered the crime scene
- Provide digital images/photographs the bottoms of the shoes of all persons and tires of all vehicles that have entered the crime scene

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## 7.0 Crime Scene Process

Each crime scene is unique and may dictate how the crime scene process occurs, but the basic stages within this section should be followed in each case.

*MSP Operations or Dispatch shall be notified when the CSRT departs the lab, arrives on scene, departs the scene and is back at the lab out of service.*

## 7.1 Preparation and Departure

### 7.1.1 New Submission within Forensic Advantage

Select a new submission and input the following:

1. Details Tab
  - a. Submission type: Crime Scene
  - b. Delivery method: Telephone call
  - c. Agencies: Primary Agency and Agency Case #
  - d. Offense:
2. Officers Tab
  - a. Investigating Officer (no submitting officer)
3. Exams Tab
  - a. Primary Section: Crime Scene
  - b. Requested Exam: Crime Scene
4. Parties of Interest Tab
  - a. Add victim/suspect info if available
5. Evidence Tab
  - a. Add:
  - b. Type: Request for CSRT
  - c. Evidence #: CSRT
  - d. Description: Request for CSRT
6. Description/Comments Tab
  - a. Sub Comments Box: Names of CSRT personnel responding with designated team leader \* AND a brief summary of crime scene details that substantiated response
7. RFLE Tab
  - a. Nothing at this time (FSD-68 is scanned in later)
8. SUBMIT
  - a. Print two submission reports
    - i. One copy for lab file
    - ii. Second copy should be provided to investigating agency

The CSRT should confirm that all necessary equipment, supplies and reagents are present before departing for the crime scene. If not already done, a CSRT Leader shall be designated for the team.

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## 7.2 Arrival of CSRT

Upon arrival to the crime scene, the CSRT members should evaluate the situation for potential threats and ensure the requesting agency has met the expectations previously set forth.

A pre-scene briefing shall be held with the investigating agency to obtain the most current information about the crime scene and investigation. This briefing also serves to confirm the CSRT has the capability and resources to meet the agency's needs and that both parties agree to the methods the team will utilize for processing the crime scene.

Additionally, the CSRT leader should discuss and confirm with the investigating agency any of the following that apply:

- The crime scene has been searched for and cleared of any potential threats/hazards to CSRT personnel
- Crime scene security to include personnel in and out of the scene and a marked uniform presence is the responsibility of the investigating agency
- Elimination sample collection
- The investigating agency is responsible for communications with the Medical Examiner's Office and their entry into the crime scene
- Forensic evidence the CSRT will be searching for and collecting
- Investigative evidence (electronic media, computers, financial documents, etc.) is not routinely collected by the CSRT, but can be set aside for the agency to collect
- The investigating agency can search the crime scene further for investigative evidence upon completion of the forensic evidence collection
- A point of contact from the investigating agency to relay information from the crime scene

If a perimeter has not been established with barrier tape or other means, the CSRT should set one up before processing the crime scene.

If necessary, the CSRT may need additional MSP resources which can be requested through Operations or Dispatch.

## 7.3 Conclusion of Crime Scene Response

CSRT personnel shall confirm that evidence is accounted for on the CSRT vehicle and secured for transport to the laboratory. A final search of the crime scene should be conducted to confirm no equipment was left behind.

A post-scene briefing shall be held with the investigating agency to discuss any of the following that apply:

- Updated investigative information pertinent to the crime scene processing or lab analyses
- Forensic observations, processing techniques employed, and evidence collected by the CSRT
- Additional crime scene processing the agency may need or requests be done
- Chemicals utilized within the crime scene and provide SDS sheets
- Authorization from the investigating agency to consume any samples collected
- A CSRT evaluation form (FSD-40)
- Providing a tabulation of evidence collected (or agreeing that one is provided later)
- Turning over custody of the crime scene to the investigating agency
- Availability of crime scene images and any other documentation that may be of value to the investigation

CSRT personnel should decontaminate themselves to avoid transferring any contaminants to the CSRT vehicle.

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### 7.3.1 Debrief

The CSRT that responded should meet after the conclusion of the crime scene to debrief. Part of the debriefing process should include a discussion of the strengths and weaknesses of our response and processing of the crime scene. Any innovative techniques or developments that could improve our CSRT's across the state should be provided in writing to the technical leader of crime scenes.

## 7.4 Return to the Laboratory

### 7.4.1 Evidence Storage

Evidence from the crime scene shall be placed in an appropriate secure storage area, preferably crime scene storage.

### 7.4.2 Evidence Container Labeling in Forensic Advantage

Containers of evidence from the crime scene created within forensic advantage shall be assigned the corresponding L-number to the item it contains. When the container contains multiple sequential L-numbered containers/items inside, the container number shall depict that sequence (e.g., Container L-1 – L-5) or detail the sequence in the container description. Evidence containers that contain non-sequential multiple L-numbered items/containers shall be assigned a corresponding L-number to at least one of the container/item numbers within it and the description of the container shall list all of the L-numbered containers/items within it.

### 7.4.3 New Submissions within Forensic Advantage for Laboratory Analysis

Create a new submission for each unit that receives evidence first (if pieces going to multiple units the additional units analyzing get new case records under this submission):

1. Details Tab
  - a. Submission type: Forensic Examination
    - i. Be aware the system defaults to crime scene but needs to be changed to forensic examination
  - b. Delivery method: crime scene storage bin
    - i. This eliminates the need for a submitting officer/person
2. Officers Tab
  - a. Investigating officer
  - b. No submitting officer necessary
3. Exams tab
  - a. Primary Section: First unit the evidence is to be transferred to
  - b. Add requested exam necessary
    - i. First exam type is the primary section selected above
  - c. Add additional exams if the evidence will be processed by additional units
4. Parties of interest
  - a. Add info if available
5. Evidence Tab
  - a. Add containers for all the evidence that was collected and going to the selected unit for this submission
    - i. Utilize the date/time that is generated at the time the evidence is created
6. Description/Comments

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- a. If going to multiple units, add this to the “Sub Comments” at the bottom of this window
- 7. RFLE
  - a. Scan or import the FSD-68 form\*

*\* Per the LOM, the FSD-68 shall be initialed for the laboratory analysis submissions prior to placing it in the RFLE for the submission.*

*Any evidence that the investigating agency indicates does not need laboratory analysis can be assigned to the original crime scene submission to be returned without analysis. This information shall be recorded in the case file and the crime scene report.*

#### **7.4.4 Digital Crime Scene Images**

Digital images from the crime scene shall be transferred from the camera(s) memory card(s) to a secure computer or other appropriate media for temporary storage as detailed in Official Orders. The number of digital images captured for the crime scene and the number transferred shall be recorded on the FS-37 to confirm all images have transferred (include RAW EQ images). A digital storage media (DVD, USB drive, etc.) of these images can be created for the case file and/or to be provided to the investigating agency.

All digital storage media containing the crime scene images shall be labeled with a minimum of the lab number and initials of the person that created it. The date created and number of files is also recommended to be included on the storage media.

All crime scene digital image files shall be uploaded to the department’s Digital Crime Scene Repository (DCSR).

Directions for uploading and retrieving images can be found in the CSRT discipline space on Qualtrax. For questions or issues with uploading, please contact the Digital Image Technology Section, MSP Photo Lab (First option: email [msp-photolab@michigan.gov](mailto:msp-photolab@michigan.gov), second option tx: (517) 241-2007).

Additional information about digital images can be found in section 11.0 Photography.

#### **7.4.5 Decontamination and Restocking**

Any equipment that could have been contaminated at the crime scene and was not disinfected previously shall be disinfected with ~10% bleach or other appropriate disinfectant (e.g., sprays, wipes, etc.) prior to being placed back into service. Supplies consumed during the processing of the crime scene should be restocked unless there are sufficient numbers of this type of supply still on the vehicle.

#### **7.4.6 FSD-068**

A completed FSD-068 shall be emailed to the CSRT Technical Leader after returning to the laboratory or the next business day by 10:00 am.

The FSD-068 shall also be scanned into the RFLE windows for the crime scene submission and all submissions created for the lab analysis of evidence the CSRT collected from the crime scene. The FSD-068 for lab analysis of items shall be initialed as required by the LOM. It serves as the request for laboratory examination for these submissions.

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## 7.5 Digitizing of Hardcopy Notes

Hardcopy FS-37 form(s) and all handwritten notes from the crime scene should be scanned into the object repository for the crime scene case file the next business day as a backup in case the hardcopy documents are lost or compromised.

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## 8.0 Reports and Release of Information

Crime scene reports should be authored as soon as possible after returning to the laboratory and released within thirty days of the crime scene response. If this deadline cannot be met, a note shall be added to the case record comments indicating why there was a delay.

### 8.1 Report Guidelines

CSRT Reports should follow the format depicted in the CSRT Report Template in Appendix A of this manual. At a minimum, the report should contain the following sections with the understanding that not all sections are relevant in all cases:

- Request for Crime Scene Assistance
- Arrival of Michigan State Police (MSP) Crime Scene Response Team (CSRT)
- MSP CSRT Personnel
- Location/Description of The Crime Scene
- Crime Scene Processing (narratives by discipline)
- Location/Condition of Victim (if present)
- MSP CSRT Departure
- Evidence Collected
- Disposition of Evidence
- Laboratory Analysis
- Information for the Investigating Agency
- Digital Images and Sketches
- Additional Remarks (optional)

*Opinions shall not be included in CSRT reports. Measurements as descriptors can be included in the report (see Section 10.3 of this manual).*

#### 8.1.1 Finalization of Report

At the completion of writing the report, all members of the CSRT that responded should have the opportunity to review the report and offer suggestions/changes, so it can be finalized and submitted for a technical/administrative (tech/admin) review. Once the report is finalized to be submitted for tech/admin review, supporting documentation that has not already been scanned and approved shall be scanned into the object repository and approved.

#### 8.1.2 Required Supporting Documentation

At a minimum, the following files that exist shall be included in the case file:

- Notes
- Sketches/diagrams (created by CSRT personnel at the scene or in the lab)
- Search warrant and/or consent to search form(s)
- Digital file(s) with all of the digital images captured at the crime scene (to include EQ images)
  - Preferred to create separate digital file with the EQ images
- Technical review checklist

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All digital files in the object repository shall contain the laboratory number in the file name and either be approved by the report author or have the report author's initials in the file name (e.g., GR19-1234\_GWN\_FS-37).

## 8.2 Technical and Administrative Reviews

All reports shall be technically and administratively reviewed. The FSD Laboratory Operations Manual and Quality Manual detail some requirements of these reviews in addition to those detailed below.

Typically, the technical and administrative reviews are combined and are performed by a single person (admin/tech reviews), but they can also be done by two separate people. The technical review shall be performed by a crime scene analyst that was not part of the team that responded to the crime scene being detailed in the report they are reviewing.

All changes/suggestions/comments from the technical/administrative review(s) shall be documented in the review comments when the review is returned or on the technical review checklist in the object repository. If changes cannot be adequately explained in the review comments, it may be necessary to insert a copy of the report or other documents with the reviewer's comments into the object repository for the case record.

The technical review of finished sketches/diagrams that are created after the crime scene report has been released (for court or other purposes) is detailed in Sketches and Diagrams Section of this procedures manual.

### 8.2.1 Technical Review

A technical review checklist (available in the CSRT discipline space on Qualtrax) shall be used and placed in the object repository for the case record. The report author shall approve the checklist in the object repository or add their initials to the file to signify they have reviewed it.

The technical review shall include but is not limited to the review of all examination documentation within the case record and the test report to ensure:

- Conformance with proper technical procedures for crime scene processing
- Conformance with the applicable laboratory operations and quality assurance policies and procedures
- Object repository contains the required files with the lab number in the file name and approved or initialed by the author
- Handwritten notes are legible
- The report contains all required information
- Equipment/instrumentation utilized is documented in the notes
- Performance checks of equipment passed and were documented in the notes
- Accurate calculations and data transfers
- Directions correspond between notes, sketch and report and are the actual correct orientation
- Chemicals/Reagents used were documented properly and included in the report (type, areas tested/processed and results)
- All information in the report is substantiated by supporting documentation in the casefile
- Evidence table in the report corresponds to the evidence table in the notes
- Evidence has been created within Forensic Advantage
- No opinions are included in the report

Technical reviews should not include comments/details that are the reviewer's preferences or writing style and fall outside of what it required in this manual.

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## 8.2.2 Administrative Review

At a minimum, the administrative review shall include a review of the case submission and record to ensure:

- The test report is free of grammatical and spelling errors
- The correct lab number is present on documents in object repository
- A request for laboratory examination (FSD-068) is present in the submission
- Communication between the analyst(s) and the agency is documented in the case file

## 8.3 Disputed Reviews

If, during the review process, the case is returned to the analyst for either an administrative or technical issue and a resolution cannot be reached, the technical leader or designee evaluates the disputed portion of the review and makes a final determination. This evaluation and determination shall all be documented and included in the case file.

## 8.4 CSRT Final Reviews by CSRT Members

After the tech/admin review has been passed, individual CSRT Final Reviews shall be assigned to each CSA and CST of the responding CSRT for their final approval of the report. If only one person responded to the crime scene, this review can be completed by the technical/administrative reviewer with a comment "N/A". CSTE's should not be assigned CSRT final reviews.

Once all of the CSRT final review(s) is completed, the report can be released. If not already done, the report author shall transfer out or consume the evidence created as the "request for CSRT", so it no longer exists within Forensic Advantage.

## 8.5 Testimony Guidelines

The following is intended to provide guidelines for FSD personnel testifying within the discipline of crime scene investigation. It does not and cannot cover every aspect of testimony that may arise. These guidelines are intended to cover testimony regardless of whether the analyst is qualified as an expert in crime scene investigation or not.

Crime scene reports do not contain opinions and therefore analysts should not give opinions on the stand unless directly asked and/or required to do so by the court. When opinions are required, they should be based on the analyst's training, knowledge, experience and based on the observations and details contained within the report and supporting documentation.

Analysts should not testify to discipline specific laboratory analysis results of evidence from the crime scene unless they performed the analysis in the laboratory.

For question(s) about the processing of the crime scene that go beyond the extent of the knowledge and experience of the analyst testifying, the analyst should defer to the CSRT member that processed the crime scene related to the question(s) being asked.

Testimony that includes conclusions/opinions related to trajectory analysis or bloodstain pattern analysis shall only be given by personnel authorized to conduct these types of analyses. Additionally, this testimony can only be

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provided if a separate report has been released containing the details of the analysis and the conclusions/opinions being offered. Analysts can provide general testimony about measurements related to these types of evidence at the crime scene if the measurements are contained within the case file.

## 8.6 Technical Review of Testimony

Whenever possible, CSRT testimony should be technically reviewed and at least one technical review of testimony shall be completed annually for each CSA or CST. The FSD Laboratory Operations Manual outlines the technical review of testimony in detail.

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## **9.0 Evidence Recognition, Collection and Preservation**

### **9.1 Evidence Search**

Crime scene processing requires a systematic and thorough search of the scene. It is of the utmost importance that physical evidence be located, handled, collected and stored in a way that ensures its integrity.

### **9.2 General Evidence Packaging**

It is critical that items of evidence be collected, handled, transported and stored in a way that ensures its integrity and prevents deterioration, contamination, loss or damage. Evidence collected by CSRT personnel shall be documented in the notes, uniquely identified with a L - number/letter, and packaged as to protect the evidence and the person(s) handling it, as well as, maintaining the chain of custody of the evidence.

All evidence that lends itself to photography should be photographed prior to collection. Examples of evidence that does not lend itself to photography include but are not limited to cellular material swabs, tape lifts, microscopic evidence, latent ridge structure prior to processing, etc.

Please refer to discipline specific sections of the following manual for specific packaging information and requirements. In general, most evidence types are packaged in breathable packaging materials such as paper bags, envelopes and boxes.

#### **9.2.1 Sharp Objects**

Sharp or jagged items (e.g., knives, needles, large glass shards, etc.) shall be packaged in containers that prevent them from compromising the container and/or injuring persons handling the container.

#### **9.2.2 Wet and Liquid Soaked Items**

Liquid or liquid soaked items require a non-porous container such as a leak-proof jars/vials, plastic bags or nylon bags. Most wet evidence should not be sealed airtight to avoid mold growth and degradation unless otherwise specified. When mold growth or degradation is a concern, these types of items can first be packaged in non-porous containers but left open and the non-porous container placed in a sealed porous container to be dried when returning to the laboratory (e.g., wet clothing placed in a plastic bag that is left open and stored inside a sealed paper bag).

##### **9.2.2.1 Drying Wet Evidence**

Wet evidence brought back to the laboratory shall be properly dried in a drying cabinet or other appropriate storage area to avoid loss of evidence and contamination.

#### **9.2.3 Volatile Evidence**

Evidence suspected of containing accelerants or other volatile substances shall be packaged in an airtight container such as nylon bags or sterile metal cans to avoid the loss due to evaporation.

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### 9.3 Evidence Labels at the Crime Scene

All evidence collected by CSRT personnel shall have at a minimum an "L" designator before the unique identifier assigned to it. Evidence containers from the crime scene shall be labeled with at least the following information:

- Laboratory number
- Unique "L" letter/number (corresponding to the item inside the container)
- Detailed description of contents and location collected from
- Date collected
- Initials of person collecting it

Additional labeling requirements for biology evidence that has been tested at the crime scene are detailed in the biology section of this manual.

### 9.4 Evidence Seals

Evidence shall be properly sealed to include the initials of the person sealing it (unless environmental conditions prohibit sealing) and placed in a protected area of the CSRT vehicle or other appropriate storage location prior to departing the crime scene.

### 9.5 Evidence Storage at the Crime Scene

Evidence shall remain in the custody of CSRT personnel or be stored in a secured location during the crime scene response.

### 9.6 Evidence Transport

Evidence shall be transported in a manner to protect its integrity and the interests of the laboratory and customer.

### 9.7 Evidence Transfers at the Crime Scene

Forensic evidence physically collected and secured by the CSRT or the investigating agency that is transferred at the crime scene (from the agency to the CSRT or vice versa) shall be documented in the notes, so the chain of custody is maintained. Minimum documentation for these transfers is:

- Item number or other unique identifier for evidence
- Detailed description
- Date of transfer
- Signatures of both parties conducting the transfer

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## 10.0 Documentation

Documentation is extremely important to provide a detailed record of the observations, record of what was searched/processed, aid in report writing, assist with court testimony and allow for independent review by others.

### 10.1 Notes

Detailed notes shall be taken to provide a thorough and comprehensive account of the location and condition of the crime scene along with the observations, processes, equipment and techniques utilized by CSRT personnel at the crime scene. Notes can be handwritten, recorded digitally, recorded audio or any combination of these. The identity of the analyst(s) recording a note(s) shall be documented along with the note(s) being recorded.

Note taking should include at a minimum the pertinent information detailed in the applicable crime scene worksheets (FS-37, FS-37a, FS-37e, FS-37v) located on the FSD Forms Page. Not all sections of these worksheets are necessary for every situation, but these forms shall be used when recording notes physically and digitally. Fields denoted with an asterisk are typically required for the majority of crime scenes.

Blank, lined and other types of paper can be used to record discipline specific, general narrative notes not specified in the FS-37 forms, and continuation of notes from the FS-37 fields that are not large enough to capture the necessary documentation. When there is a continuation of information from an FS-37 field into the general notes, a note should be added to that FS-37 field to see the page of the notes where the information is located.

Each analyst is responsible for recording notes about what they did at the crime scene including but not limited to areas searched, processing techniques, equipment utilized, and chemicals/reagents employed. In some situations, one analyst may be responsible for all note taking, so analysts performing the processing duties being recorded in the notes should review them before departing the crime scene.

Observations, data and calculations shall be recorded at the time they are made.

### 10.2 Sketches and Diagrams

Sketches and diagrams serve to establish spatial relationships, provide an overall view of the crime scene, assist with the preparation of demonstrative aids for court, and serve as an investigative aid for investigators. They can be hand drawn or created digitally utilizing MagicPlan or another approved application or software. The areas sketched, type(s) of sketch(es) and items included or excluded in the sketch are left to the analyst's discretion.

Sketches shall be labeled with at least:

- Lab number\*
- Area sketched
- North directional arrow
- Indication of to scale or not
- Name or identifier of person creating the sketch\*

*\* Digital sketches can have the labels above with asterisks in the file name instead of on the actual sketch.*

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## 10.2.1 Magicplan Application

Magicplan can be used at the crime scene or after the crime scene to create digital sketches. The application is located on the CSRT iPad and can be used in conjunction with the laser measurer for a scaled diagram. A quick reference guide is available on the Discipline CSRT page in Qualtrax.

## 10.2.2 Release of Sketches/Diagrams

Sketches and diagrams created by the CSRT for release to an external customer shall be technically reviewed prior to being released.

## 10.3 Measurements

*All measurements described in this manual are considered approximations. Measurements included in CSRT reports shall only be reported as descriptors.*

For example:

- *Item 2 was 28in from the west wall and 15in from the north wall*
- *Bullet hole A was 20in up from the floor and 50in west of the doorway*
- *The bloodstain was 5ft up on the south wall and 3ft east of the edge of the bedroom window*
- *The living room was 18ft 6in by 10ft 8in*

When creating sketches/diagrams or notes about pertinent investigative distances/heights, measurements should be taken. The measurements can provide a reference for the scene dimensions, show the interrelationships of objects/items, and enable scale reproductions. Dimensions of rooms/areas sketched are useful to create scaled diagrams in the future.

When a decedent is present at a minimum, the location of the decedent's head, hands and feet should be measured and recorded.

### 10.3.1.1 Rectangular Coordinates (Coordinate Method)

An object or item of evidence is located by making measurements at right angles from each of two walls. This type of measurement works well indoors. It is recommended to be consistent with taking measurements from the same two walls in a room.

### 10.3.1.2 Triangulation

Measurements are taken from two fixed points within the crime scene to the object or item of evidence. The fixed points should be documented in a sketch or recorded in the notes.

### 10.3.1.3 Reference Point

A reference point (permanent object within the crime scene) is established and a tape measure is extended in a cardinal direction (or other documented direction) with the zero end at the reference point. This tape measure is referred to as the baseline. A second tape measure or other measurement device is then used to measure the item of interest perpendicular from the baseline. The location of the item of interest are then recorded as two different dimensions from the reference point.



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### 10.3.2 Vehicle Track Measurements

Measurements of vehicle tracks at the crime scene can be utilized to search for potential makes/models of vehicles that could have left them. They can also be used to associate/eliminate suspect vehicles in question. The measurements described in the following section can also be obtained from a vehicle in a similar fashion by taking them directly from the vehicle and its tires. All vehicle track measurements of value should be documented clearly in the notes.

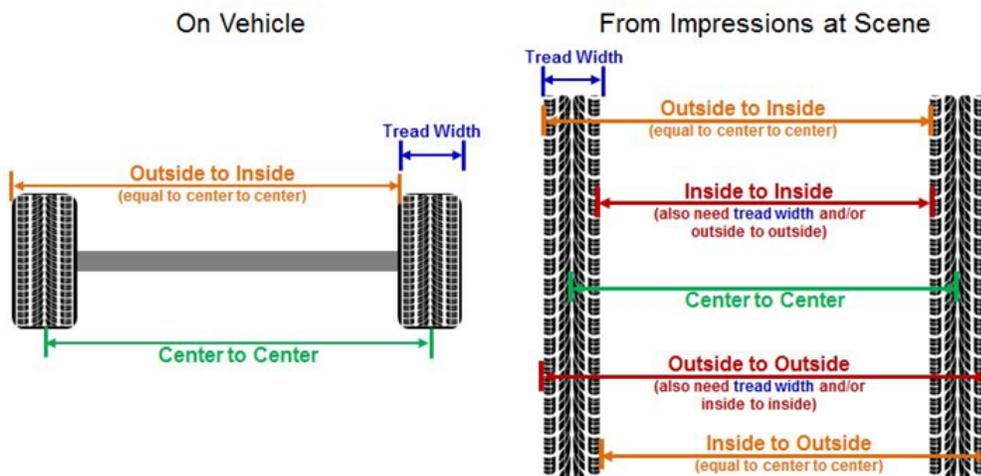
#### 10.3.2.1 Vehicle Track Width (Stance)

Track width (stance) of a vehicle is the distance between the center points of the tires from one vehicle side to the other (see diagram below). The center to center distance is preferred for this measurement but whenever possible, take all measurements detailed below. Typically, the front and rear track width is slightly different for vehicles and when possible, both should be measured and recorded. Measuring the width of each tire or tire track is also recommended.

When possible, the measurement should be made perpendicular from the center of one track to the center of the track from the other side of the vehicle. Estimation of the center of the tire track can be challenging with some impressions and another option is to measure perpendicular from the outside edge of one track to the inside edge of the track from the other side of the vehicle.

It can be very difficult to determine which tracks are from the front of the vehicle and which are from the rear. If you cannot conclusively determine them, simply record the measurements without designating them as front and rear.

#### Vehicle Track Width Measurement (Stance)





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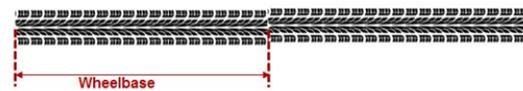
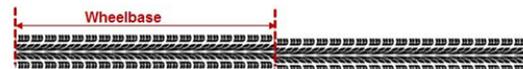
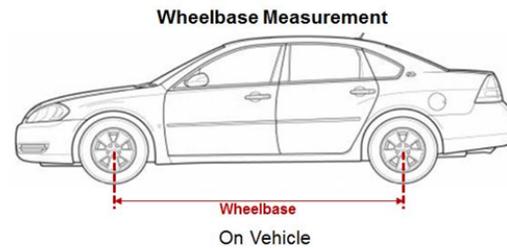
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### 10.3.2.2 Wheelbase

The wheelbase is the distance between the front and rear axles of a vehicle. As it relates to vehicle tracks at the crime scene, the wheelbase measurement should be made from the leading edge of the rear tire track to the leading edge of the front tire track on the same side. When possible measure the wheelbase for both sides of the vehicle.

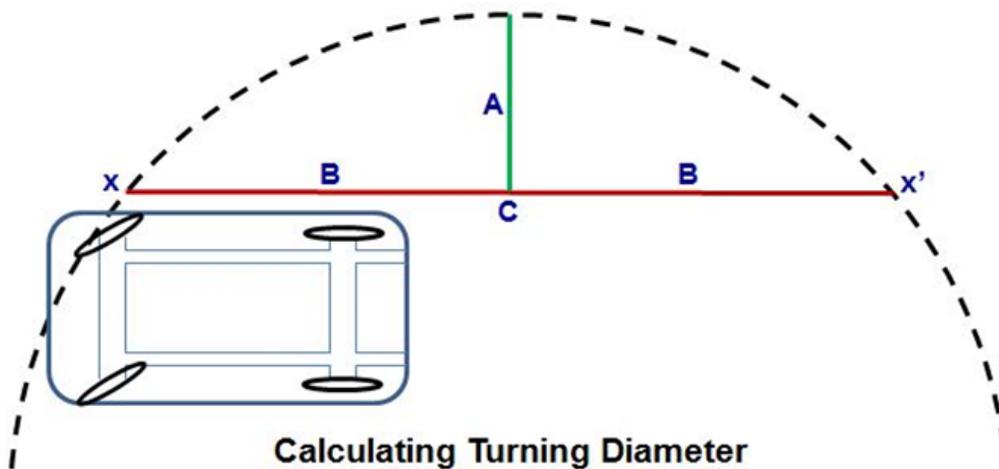


From Impressions at Scene

### 10.3.2.3 Turning Diameter

The turning diameter of a vehicle is the diameter of the circle a vehicle makes when its steering wheel is fully turned. This measurement may be able to be captured at the crime scene and should be done as follows (see associated diagram below):

1. Select a segment of the impression that reflects the sharpest portion of the turn
2. Lay a measuring tape along an imaginary connecting the two points of the outer margin of the track arc (line  $x - x'$ ) and collect the measurement between these outer margins
3. Bisect the arc at the center of this tape measure (C) with another line perpendicular and extending out to the outside edge of the tire track arc (A)
4. The distance between C - x or C -  $x'$  is equal and is referred to as B in the formula below
5. The turning diameter can then be calculated with the formula: **Turning Diameter =  $(B^2/A) + A$**



### 10.3.3 Temperature Measurements

All temperature measurements taken within crime scene investigation are approximate.

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## 11.0 Photography

Photographs and/or digital images provide a visual representation of the crime scene by capturing the crime scene before, during and after processing. This is an essential part of documenting the crime scene and supplements the other forms of documentation.

*If any digital images taken are not of sufficient quality, additional images should be captured. Digital images captured at the crime scene shall not be deleted. Image file names generated by the camera shall not be changed.*

### 11.1 General Photography

Photographs can often provide information that may otherwise be overlooked or be difficult to verbally describe in minute detail.

Photographing a crime scene should be done systematically to ensure that the crime scene analyst always knows that all necessary photos were taken. A crime scene photography checklist is available to assist with capturing the necessary photographs.

#### 11.1.1 Initial Images

The crime scene should be photographed prior to any processing or movement of items unless extenuating circumstances exist that do not allow for this. The extenuating circumstances should be documented in the notes. The initial images should include:

- The submission report (including the photographer's name or identifier) or an informational document with pertinent case information (lab number, date, photographer name/identifier)
- Whenever possible a landmark of some sort to document the location of the crime scene
- A 360° perimeter overlapping view of the crime scene
- Access routes to/from scene and all possible points of entry to buildings
- Relevant vehicles at the crime scene
- Interior of residence/building with overlapping series of photos showing transition from room to room inside

#### 11.1.2 Evidence Images

All items of forensic physical evidence that can be photographed should be photographed before being collected. Each item collected should be photographed with a unique identifier visible whenever possible. The preferred sequence of photography of evidence is:

- Distant/Overall
- Midrange
- Close-up

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### 11.1.3 Decedent Images

All decedents present at the crime scene should be extensively photographed to establish their location within the crime scene, clothing, injuries, bloodstain patterns and any other relevant details. These images should include:

- A 360° perimeter overview of decedent
- Midrange
- Close-ups of the decedent's face, hands (inside and out when possible), feet (top and bottom when possible), possible injuries, impression evidence, etc.
- The area under the decedent after they have been removed

## 11.2 Nighttime Photography

Nighttime exterior photography poses challenges because the area being photographed is normally too large to be illuminated by a single flash firing only once. Long exposure or painting with light photography should be utilized to overcome this issue.

### 11.2.1 Long Exposure Photography

This method utilizes ambient light present in the environment in conjunction with long exposure times to capture the scene with sufficient illumination. The photographer may have to experiment to find the correct settings for the environment being photographed.

1. The camera should be in manual mode and secured on a tripod
2. A shutter release cable should also be used to avoid camera shake (if not available, set the shutter release timer)
3. Manual focus should be used to focus on the object/area to be photographed
4. No flash or other light source should be used
5. Set the shutter speed to a long exposure time or "bulb" and a medium sized aperture
6. Start with approximately a one-minute exposure and adjust from there

### 11.2.2 Painting with Light

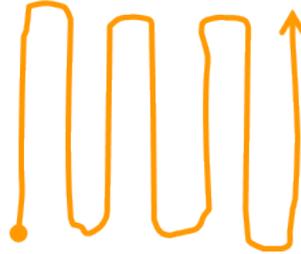
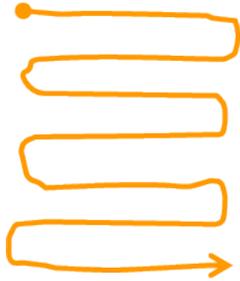
Painting with light can be accomplished with two different methods. A flashlight or an external flash fired multiple times to paint the object or area of interest.

#### 11.2.2.1 Flashlight Method

This method is especially useful for photographing specific objects such as buildings and vehicles but can also be utilized for landscape photos.

1. Follow steps 1 – 3 above in long exposure photography
2. The shutter speed should be set to a long exposure or "bulb" setting (open long enough to paint the entire area/object with the flashlight)
3. A medium size aperture to start (dependent on the ambient light present)
4. Once the shutter is open, use a strong flashlight to paint the entire area(s) visible in the viewfinder moving the beam back and forth across (like reading the lines of this text) and then up and down (see figures below)
5. Close the shutter

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### 11.2.2.2 External Flash Method

This method is especially useful for photographing specific landscapes but can also be utilized for objects such as buildings and vehicles. Reflective objects are difficult to photograph with this method because of significant reflection each time the flash fires. It is best to have two people to photograph with this method. One person can operate the camera and the other can operate the external flash.

1. Follow steps 1 – 3 above in long exposure photography
2. The shutter speed should be set to the "bulb" setting
  - a. Set the external flash to manual mode and with a power of approximately 1/4 to 1/16 (dependent on the size and type of object being photographed)
3. The shutter should be locked open and then the flash operator starts at a point furthest from the camera and start firing the flash pointed away from the camera
  - a. The external flash should be held above and in front of the operator to avoid them being visible in the photograph
4. The external flash is fired multiple times as the flash operator moves back toward the camera
5. Once the flash operator arrives at the camera, the shutter can be closed

## 11.3 Examination Quality (EQ) Photography/Images

EQ images capture impression evidence and other types of evidence so the resulting photograph/image can be scaled to life or natural size.

*An EQ ruler shall be utilized when capturing EQ photographs of footwear and tire impressions (see Section 4.4.1.2).*

All EQ images captured at the crime scene shall be retained as evidence.

- Footwear and tire track EQ images and establishing images (if available) shall be placed on a DVD-R or other appropriate digital storage media\*
- Latent print EQ images and establishing images (if available) shall be placed on a DVD-R or other appropriate digital storage media\*

\* Digital storage media shall be a physical storage media and preferably returned to the investigating agency unless laboratory unit procedures dictate otherwise.

The digital media(s) with EQ images shall be logged as evidence on the evidence table (notes and report) and created as a piece of evidence within Forensic Advantage to maintain the chain of custody.

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### 11.3.1 Photography Technique

It is critical to make sure the impression(s)/print(s) is in focus and captured in an uncompressed format. Capturing JPEG and RAW images simultaneously if the camera has that ability is recommended.

1. A flat EQ ruler shall be used and should be aligned parallel to the impression, at the same level as the bottom of the impression (if possible) and extending along the length of the impression (if possible)
2. An identification tag individualizing the impression being photographed should be visible in the field of view (preferably also including the lab number and an identifier for the person capturing the image)
3. The camera should be secured on a tripod and positioned so the back of the camera is parallel to the impression
4. The impression should fill the frame
5. For most impression types an oblique light source can help reveal fine detail in the impression(s)
6. Multiple images should be captured of each impression varying the position of the light source and in some cases varying the camera settings

#### 11.3.1.1 Tire Track EQ Photography

When capturing EQ photographs of long tire impressions (or any other impressions that extend outside the frame of the camera), a tape measure or other similar device should also be placed along the full length of the impression. The tape measure is present to aid in reconstruction of the entire impression using a series of images. The edges of these images should overlap, and it is strongly recommended to capture *no more than 18-inch sections* within each image.

#### 11.3.1.2 Latent Print EQ Photography

Latent print EQ images taken at the scene should be captured at a *minimum of 1000 pixels per inch* whenever possible.

#### 11.3.1.3 Tips for EQ Photography

- Avoid leaning over impression evidence with items in loose pockets as these items can fall into and destroy impressions
- When possible, a ruler that is closest to the color of the substrate you are photographing should be utilized to avoid the ruler being under or over exposed
- Align the edge of the camera field of view parallel to the ruler
- If the camera has a zoom lens, avoid having the lens zoomed all the way out which can cause distortion at the perimeter of the image
- Adding color to snow impressions (Snow Print Wax or spray paint primer) or lightening dark soil impressions (baby or talc powder) can assist with visualizing fine detail
- Wet impressions that reflect light can also be enhanced by adding a light layer(s) of baby powder, talc powder or spray paint primer

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## 11.4 Videography

Video recording of a crime scene can be done when deemed necessary. It should be done similarly to photographing a crime scene starting outside and working toward the interior and prior to evidence collection or manipulation of the scene. When possible, the audio should be turned off. Video recordings shall be retained similarly to digital images and when possible, included in the case file. A statement shall be included in the report to indicate that a video was recorded and is available.

## 11.5 Luminol and Trajectory Laser Photography

### 11.5.1 Luminol Photography

Latent areas of blood and/or bloodstains on dark surfaces may need to be documented by photographing the luminescence when treated with luminol. Ideally, two people should be used to perform luminol photography (one to control the camera and the other to spray the chemical). If it is necessary to visualize the area surrounding the luminol reaction, fill light can be used during the exposure.

Whenever suspected latent blood is detected with luminol, it should be photographed unless applying additional luminol could compromise the sample. The decision to photograph luminol reactions is left to the analyst's discretion and should be detailed in the notes.

#### 11.5.1.1 Photography Technique

1. Block or turn off any sources of light
2. Secure the camera on a tripod and set to manual mode
3. A shutter release cable should also be used to avoid camera shake (if not available, set the shutter release timer)
4. Manual focus should be used to focus on the object/area to be photographed
5. An image should be taken with the lights on our utilizing the flash to capture the area prior to the application of luminol
6. Camera settings are be dependent on the amount of ambient light present and how intense the luminol reaction is
7. A good starting point would be an exposure of approximately 60 seconds and large to medium aperture
8. Remove light sources, press the shutter release and spray the area of interest with luminol
9. Additional applications may be necessary, but take care not to over dilute the area if a biological sample is to be collected (if necessary, a biological sample can be collected prior to the luminol photography)
10. Fill light (optional) can be used during the exposure to illuminate the area surrounding the luminol reaction

### 11.5.2 Trajectory Laser Photography

Bullet trajectories can be traced with the use of a laser on a trajectory rod and may need to be documented by photographing the laser beam. Photographing laser beams requires a dark to semi-dark environment, so ambient light may have to be blocked by covering windows and other sources of light. Exterior areas may have to be photographed at night removing sources of ambient light whenever possible. Ideally, two people should be used to perform trajectory laser photography (one to control the camera and the other to highlight the laser beam). If it is necessary to capture the area surrounding the laser beam, fill flash can be used at some time during the exposure.

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The photograph can be taken from multiple locations (e.g., side view, end view, etc.) depending on the situation and what is being documented. If height or location of the beam is important a large scale can be placed near or in the laser beam.

#### **11.5.2.1 Spray Fog Technique**

1. The camera should be secured on a tripod and set to manual mode
2. A shutter release cable should also be used to avoid camera shake (if not available, set the shutter release timer)
3. Manual focus should be used to focus on the object/area to be photographed
4. Camera settings are dependent on the amount of ambient light present but a good starting point would be an exposure of approximately 60 second with a medium to large aperture
5. Turn out or remove the lights, press the shutter release to open the shutter
6. The spray fog should be sprayed directly at the laser beam and moved from one end of the beam to the other until the entire beam is visible
7. Allow time for the camera to be exposed to the highlighted beam
  - a. Additional applications of spray fog can be used to further highlight the beam
8. Fill light (optional) can be used during the exposure to illuminate the area surrounding the laser if necessary
9. Close the shutter

#### **11.5.2.2 White Card Technique**

1. Follow steps 1 – 5 above in the spray fog technique
2. The card should be held at approximately 45° to the camera at one end of the laser and moved slowly along the path of the beam ensuring the laser is striking the card the entire time until the other end of the laser is reached
3. Fill light (optional) can be used during the exposure to illuminate the area surrounding the laser if necessary
4. Close the shutter

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## 12.0 Biological Evidence

Biological evidence is generally in the form of liquid or dried blood, cellular material, semen, saliva and tissue. Other biological evidence may also be encountered. Proper collection includes preventing contamination from extraneous sources at the crime scene.

The BFI Procedures Manual provides additional information to what is provided in the following sections and is available for your review.

### 12.1 Search for Biological Evidence

When searching for biological evidence, bright lighting is essential. In addition, an alternate light source (ALS) and chemical processing may be useful and should be considered. When cleanup or alteration of blood or other liquids is suspected, areas where liquids may have soaked or flowed should be searched (e.g., areas under carpet, behind base boards, basement ceilings, etc.) and chemical processing may be necessary.

For procedures on the use of an ALS for searching, please refer to Alternate Light Source section of this procedures manual.

### 12.2 Biological Testing

Presumptive tests and blood processing reagents employed at the crime scene shall adhere to the requirements detailed in Section 5.0 of this procedures manual.

#### 12.2.1 Labeling of Containers of Presumptively Tested Evidence

The type and results of the presumptive test(s) conducted at the crime scene for biological samples shall be written on the exterior container along with wording that clearly indicates it was performed at the crime scene.

### 12.3 Collection and Packaging of Biological Evidence

The condition and location of the biological evidence should be documented before it is collected. It should also be photographed with an item number present in the photograph when possible. The number and type of samples collected is based on a number of factors including but not limited to the type of case, nature of the crime scene, and the number of victims and/or perpetrators. The biological evidence collected at the crime scene is left to the discretion of the analyst processing for biological evidence.

Disposable and/or single use tools/instruments should be used for handling and/or collection of biological evidence at the crime scene whenever possible. Items identified as single use shall be disposed of after use and shall not be used to examine/collect the next item.

Non-disposable tools/instruments shall be thoroughly cleaned and decontaminated before being used to collect each piece of biological evidence. If a portion of a non-disposable tool/instrument (e.g., utility knife blade, scalpel blade, etc.) can be disposed of, it should be changed after each use for collection of biological evidence.

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A new pair of nitrile or other protective gloves shall be worn for each piece of biological evidence collected. A surgical mask or respirator is strongly recommended to be worn when collecting biological evidence, especially cellular material evidence.

For smaller items, collecting the entire item is preferred. For larger objects and/or permanent objects, stained areas can be removed/collected or swabbed.

## 12.3.1 Swabbing

### 12.3.1.1 Dry Stains

1. Moisten cotton swab with sterile water
2. Swab the stain so that the bodily fluid absorbs into the cotton
3. Place the swab back in the original package or other protective breathable container
4. Place the swab/container into an envelope or other suitable breathable container

### 12.3.1.2 Wet Stains

1. Absorb the liquid into the cotton swab
2. Place the swab back in the original package or other protective breathable container
3. Place the swab/container into an envelope or other suitable breathable container

### 12.3.1.3 Cellular Material Collection

1. Moisten a sterile cotton swab with sterile water
2. Swab the entire item/area with the moistened swab
3. Place the swab back in the original package or other protective breathable container
4. Swab the same item/area with a second dry sterile swab
5. Place the swab back in the original package or other protective breathable container
6. Place both swabs/containers into an envelope or other suitable breathable container

## 12.3.2 Cutting

Areas supporting biological evidence can be cut from the item/surface as deemed necessary by the analyst.

*When possible, the entire stain should be cut out rather than cutting through the stain. Cutting through the stain can contaminate the cutting instrument and increase the risk of contamination if an injury to the analyst results from the cutting instrument.*

## 12.3.3 Swabbing Under or Cutting Fingernails

In some cases, it may be necessary to collect swabs from under people's fingernails or take fingernail cuttings. The collection of swabs or cuttings is left to the discretion of the analyst processing for biological evidence.

### 12.3.3.1 Swabbing

1. One sterile swab followed by one sterile dry swab should be used per hand
2. Moisten a sterile cotton swab with sterile water
3. Gently swab under each fingernail
4. Place the swabs back in the original package or other protective breathable container

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5. Gently swab under each fingernail of the same hand with a second dry sterile swab
6. Place the swab back in the original package or other protective breathable container
7. Place both swabs/containers into an envelope or other suitable breathable container labeled with the correct hand they were collected from
8. Repeat steps 1 - 7 for the other hand

### **12.3.3.2 Cutting**

1. Using a sterile fingernail clipper, clip each nail from one hand and place them into a paper packet or other appropriate container
2. Clean and decontaminate the fingernail clippers
3. Follow step 1 for the fingernails from the other hand

### **12.3.4 Hair Collection**

If hairs are observed during a search, they can be removed by a gloved hand, forceps or adhesive lift. For mass collection including hairs, adhesive lifts can be collected. For procedures on collecting adhesive lifts, see the trace evidence section of this procedures manual.

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## 13.0 Bloodstain Patterns

Bloodstain patterns at a crime scene can provide valuable insight into mechanisms/events that could have created them, sequence of events and other valuable information, so it is important to properly recognize, document and collect them at the crime scene. Recording the location, orientation, size and position of bloodstains with respect to the crime scene through a combination of notes, sketches and photography is essential for performing bloodstain pattern analysis in the future.

If there is extensive bloodstaining in multiple areas of the crime scene and impact patterns may be present, it is recommended to consult with or request a bloodstain pattern analyst.

The Bloodstain Pattern Analysis Procedures Manual has additional details about bloodstain patterns on items and spatter patterns that can be used for area of convergence (AOC) and area of origin (AOO) determination. The information in the BPA Procedures Manual supplements the information within the following section.

### 13.1 Search for Bloodstain Patterns

Please refer to Section 12.1 Search for Biological Evidence section of this procedures manual.

### 13.2 Bloodstain Pattern Notes

Notes about bloodstain patterns should include as necessary: location, orientation, physical characteristics (size, shape, distribution and including characteristics that may aid in identifying the specific pattern type), and classification of general pattern type (if possible). Organization and labeling of patterns should follow the “road mapping” technique as described in the Bloodstain Pattern Photography section below. Areas absent of bloodstaining may also be of value and should be included in the documentation when deemed necessary.

### 13.3 Bloodstain Pattern Sketches/Diagrams and Measurements

The specific location and orientation of a pattern is important, so sketches including bloodstain patterns can be done when deemed necessary. Measurements of the location of patterns (using the coordinate method to the center or perimeter of the pattern) can also be recorded on the sketch, in the notes and/or through photography.

#### 13.3.1 Area of Convergence (AOC) and Area of Origin (AOO) Measurements

Measurements to determine/document AOC(s) and AOO(s) shall require a qualified bloodstain pattern analyst. Please refer to the Bloodstain Pattern Analysis Procedures Manual for detailed procedures on these techniques.

### 13.4 Bloodstain Pattern Photography

Detailed photography of bloodstain patterns is the most critical component for the documentation of bloodstain patterns. Bloodstain patterns should be photographed prior to collecting samples. Bloodstain patterns should be photographed utilizing the road mapping technique or a technique that will allow for road mapping in the future. This is done by introducing a variety of scales and labels onto the bloodstained surface(s), so that individual patterns/stains in the photographs can be easily differentiated with the distant, midrange and close-up bloodstain pattern images.



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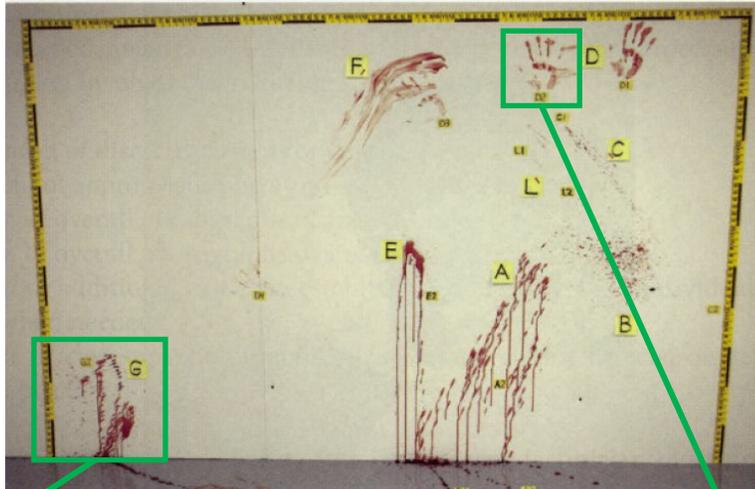
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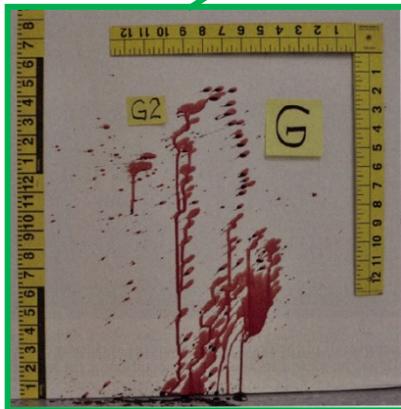
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- Ideally, labels identifying each potential pattern and ruler tape or another measuring device is present in distant photos to coordinate the location of patterns (X and Y coordinates).
- In the midrange photographs, if possible, at least one of the measurement devices showing location and a label with a scale should be present
- Close-up photos should contain a metric scale with the pattern label to document the size of stains within the pattern

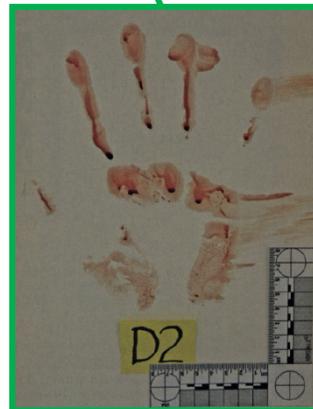


Images from  
*Practical Crime  
Scene  
Processing and  
Investigation.*  
Ross M. Gardner

Mid-  
range



Close-  
up





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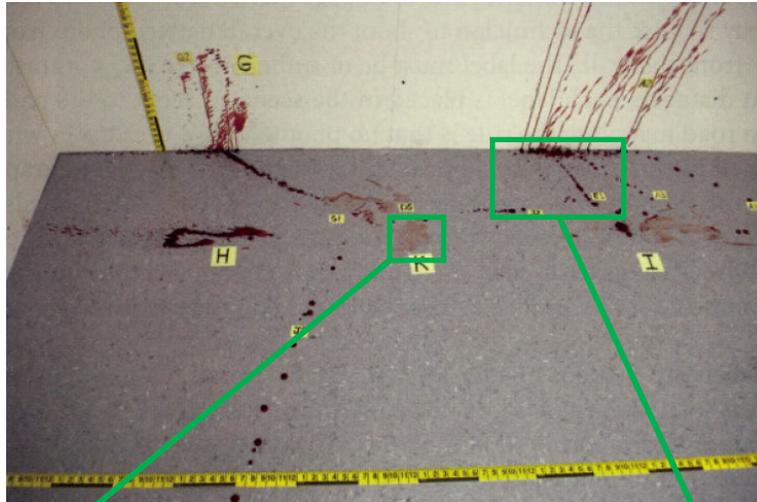
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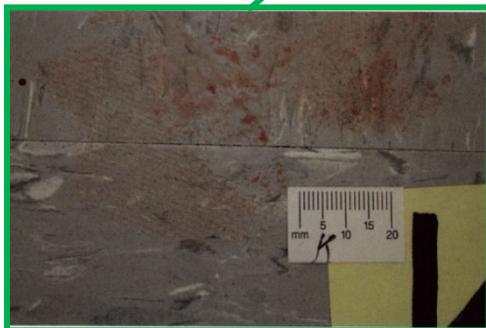
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Close-up



Mid-range



Whenever possible, photographs of bloodstain patterns should be captured with the back of the camera aligned approximately parallel to the surface(s) the patterns are on.

When there is limited bloodstaining present at the scene, the road mapping technique may not be necessary and bloodstain patterns should be photographed similarly to evidence with distant, mid-range and close-up photographs. Distant and/or mid-range photographs of bloodstain patterns on vertical surfaces should contain a measurement device showing the height of the pattern. Close-up photographs of bloodstain patterns should contain a metric scale.

### 13.4.1 Photography of Bloodstain Patterns on Objects

When photographing items with bloodstain patterns on them, it is advised to photograph them in their position as found, all sides of the object, and the area after the object has been removed.

### 13.4.2 Photography of Bloodstain Patterns on People

Bloodstains on the decedent or other people should be photographed prior to moving them when possible. These photographs should follow a similar technique as described above (distant, mid-range, and close-ups).

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### **13.4.3 Area of Convergence and Area of Origin Photography**

Photography of spatter patterns utilized to determine/document AOC(s) and AOO(s) require a qualified bloodstain pattern analyst. Please refer to the Bloodstain Pattern Analysis Procedures Manual for detailed procedures on these techniques.

### **13.5 Collection and Testing of Bloodstain Patterns**

Testing at the scene and/or collection of stains or portions of patterns for laboratory testing and/or DNA analysis can be important for bloodstain pattern analysis in the future. Whenever possible, at least one representative stain from each documented/distinct pattern should be presumptively tested or collected for testing and potential DNA analysis back at the laboratory.

When bloodstains and/or patterns are obviously blood because of their proximity to areas or objects that are heavily bloodstained (e.g., a decedent with wounds and bloodshed, pools, heavy saturation stains, etc.) testing and/or collection for future testing/DNA analysis may not be necessary and is left to the analyst's discretion.

When appropriate, smaller/portable items supporting bloodstain patterns can be collected for documentation and analysis back at the laboratory.

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## 14.0 Controlled Substances Evidence

*Collection of controlled substance evidence from a crime scene is primarily the responsibility of the investigating agency and not the MSP CSRT. This should be clearly communicated to the investigating agency during the pre-scene briefing or when suspected drug evidence is observed in the crime scene. If drug evidence is collected by MSP CSRT personnel, the following procedures should be followed.*

*Drug evidence should be regarded as potentially hazardous. Gloves shall be worn when collecting drug evidence. Avoid skin contact with suspected drug evidence. Respirators or dust masks may be necessary in areas with a high volume of airborne drug-related particulate such as marijuana grow operations.*

### 14.1 Search for Controlled Substances Evidence

Drug evidence at a crime scene is detected primarily by a general visual search.

### 14.2 Documenting Controlled Substances Evidence

Document and photograph drug evidence similarly to other types of evidence collected from a crime scene.

### 14.3 Collecting and Packaging Controlled Substances Evidence

Drug evidence should be retained as found in its packaging, if any, and placed into a plastic or paper evidence bag or an envelope. Make sure loose material cannot leak out of the container.

#### 14.3.1 Handling Special Evidence Types

If drug evidence also requires latent print processing:

1. Separate packaging from drug evidence if possible.
2. For residues or liquids, keep evidence as is and discuss with a drug analyst if latent prints or drug analysis should be performed first.

Liquids, syringes, and broken glass:

1. Liquids should be submitted in capped bottles or vials.
2. Syringes and broken glass should be packaged in puncture-resistant packaging, such as a plastic tube

Perishable evidence (food and beverages):

1. Package in a leak-proof container
2. Store in a secure refrigerated area

Pills/Tablet evidence

1. Package in crush resistant container

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## 15.0 Digital Evidence

Digital evidence should be collected by the investigating agency personnel with expertise in this discipline or MSP - Computer Crimes personnel whenever possible. The MSP Computer Crimes Unit contacts are available thru MSP – Operations or can be found on a list on the Crime Scene Response Team Page in Qualtrax. When the investigating agency does not have personnel with the expertise to collect digital evidence and no MSP - Computer Crimes personnel are available CSRT personnel can collect digital evidence following the procedures in this section.

If there is information that could indicate digital evidence could be hidden or concealed within the crime scene, the agency should be advised that canine units are available that can locate it.

Digital evidence can be considered any device that contains a processor and that can store digital or electronic data. The following list contains typical digital evidence that may be found at a crime scene but is not an all-inclusive list.

- Computers (e.g., laptops, towers, desktops, etc.)
- Cellphones
- Tablets
- Digital cameras and video cameras
- GPS
- Internal and external hard drives
- Flash drives
- SD and micro SD cards
- Network Attached Storage devices (NAS)
- Game systems (e.g., Xbox, Playstation, etc.)
- New automobile technology (e.g., Sync, uConnect, etc.)

*Most digital evidence is sensitive to static, magnetic fields, police radio systems, extreme heat/cold and sunlight. Do not store this evidence in plastic bags/containers or other containers that can create static and damage the device. If placing items in the CSRT vehicle or other law enforcement vehicle with a police radio, do not store them near the radio system.*

*Follow general evidence procedures for documenting digital evidence by taking notes and photographs. Mark exterior containers as containing "SENSITIVE ELECTRONIC MEDIA".*

*Network devices are susceptible to remote access and loss of evidence. These types of devices should be collected as soon as possible once discovered.*

### 15.1 Collection Procedures

Electronic devices that can be accessed via a cellular network should be placed in a Faraday container or other container that cuts off the cellular connection.

#### 15.1.1 Computers

If the computer is turned off, do not turn it on. Collect it and any associated cables/cords into an antistatic container (paper or cardboard)

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If computer is on, photograph the screen and note any open windows/programs. Photograph the location of cords and other items plugged into the computer. Disconnect the power from the back of the machine (not from the wall or electrical source). If it is a laptop, remove the battery. Place the device and any associated cables/cords into an antistatic container (paper or cardboard).

Always search the area around the computer and other areas the computer may be used for notes that contain encryption keys and passwords. If these items are found, collect them.

### **15.1.2 Cell Phones and Tablets**

If the device is turned off, do not turn it on. Collect it and any associated cables/cords into a Faraday container or other container that cuts off the cellular connection.

If the device is on, put it in airplane mode if possible. If there is any concern with putting it in airplane mode, just place the phone and any associated cables/cords in a Faraday bag or other container that cuts off the cellular connection.

Do not attempt to unlock or access the cell phone. If information on the phone could be useful to the investigation, it is up to the investigating agency to do so.

### **15.1.3 Other**

#### **15.1.3.1 Smart Watches**

Turn the device off and collect the docking station and associated cables/cords if possible into an antistatic container (paper or cardboard).

#### **15.1.3.2 Digital Camera / Video Camera**

Do not attempt to unlock, access the device, or look thru images/videos. If information on the phone could be useful to the investigation, it is up to the investigating agency to do so.

Collect the device and any associated cables/cords into an antistatic container (paper or cardboard).

#### **15.1.3.3 GPS Units**

If the device is turned off, do not turn it on. Collect it and any associated cables/cords into an antistatic container (paper or cardboard).

If the device is on, turn it off and collect it along with any associated cables/cords into an antistatic container (paper or cardboard).

#### **15.1.3.4 Internal/External Hard Drives**

If internal drives are located outside the computer, collect them and any associated cables/cords into antistatic container (paper or cardboard).

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External hard drives should be unplugged (from the computer and power source) and all items (including associated cables/cords) placed in antistatic container (paper or cardboard).

### 15.1.3.5 Flash Drives

Flash drives come in all shapes, sizes and designs.



Remove from computer by pulling out of the USB port and package in antistatic container. These devices should not be left in the computer for collection because they can be bent or damaged during transport. If the computer is also being collected, the flash drive can be taped to the computer to indicate it was removed from a specific computer.

### 15.1.3.6 Memory Cards



Can be submitted in the device or removed from the device and packaged separately. Do not remove memory cards from cell phones.

### 15.1.3.7 NAS Devices



Take photos of the digital screens when possible to show I.P. address and RAID configuration. Unplug and collect the device and any associated cables/cords into antistatic container (paper or cardboard).

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### **15.1.3.8 Gaming Systems**

Follow the collection procedure above for computers and collect all cables and one controller. If external devices attached, collect these separately.

### **15.1.3.9 Wireless Routers**

Wireless routers may have external hard drives or flash drives connected that need to be collected as described previously. Routers do not need to be collected.

### **15.1.3.10 Peripheral Devices**

Peripheral devices such as keyboards, mice and monitors do not need to be collected.

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## 16.0 Firearms Evidence

Firearms evidence at a crime scene encompasses a variety of types including, but not limited to:

- Firearms
- Cartridges
- Bullets/Fragments/Lead cores
- Fired cartridge cases
- Shotshells and components (e.g. pellets, wads, shot cups and slugs)
- Impact sites (e.g. penetrating, perforating and non-penetrating)
- Clothing for gunshot residue

In cases involving suspicious circumstances, the determination of shots fired or trajectory analysis, it is recommended to consult with or request the presence of an analyst trained in trajectory analysis.

### 16.1 Firearms Safety

Safety is the first consideration when handling a firearm. *Always treat every firearm as if it is loaded and keep it pointed in a safe direction*

Every effort should be made to render a firearm safe prior to packaging. In the event this is not possible, the reason should be documented in notes and “Loaded Firearm” or a similar phrase shall appear in large print on the evidence container. The firearm should be secured in such a way as to prevent an accidental discharge.

#### 16.1.1 Rendering Firearms Safe

The location and condition of a firearm should be documented prior to rendering it safe (see section 16.2 of this manual).

*When rendering a firearm safe, care should be taken to avoid destroying any latent, trace, blood or other evidence that may be present.*

General procedure for rendering a firearm safe:

1. Keep muzzle/barrel pointed in a safe direction
2. Keep finger off the trigger
3. Remove detachable magazines
4. Open the action and remove any cartridges or casings from the chamber
  - a) Revolver – verify the hammer is de-cocked. Document the position of the cylinder and any cartridges or fired cartridge cases present (see section 16.2.1 of this manual). Release the cylinder from the frame and remove all ammunition from the cylinder.
  - b) Magazine-fed pistols and long guns – *remove the magazine first*, then any chambered cartridges.
  - c) Other long guns – Open the action by moving the bolt, slide, or lever. Remove any chambered round. Remove all other ammunition from the firearm.
  - d) Break-open firearms - The action of some firearms, such as single shot or break-open shotguns and rifles, and derringers have to be opened by pressing or turning an action release lever usually located near the action of the firearm.

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- e) Other firearms – treat all other (black powder, automatic, altered, or otherwise unknown) firearms as if they are loaded and seek assistance when rendering them safe. The action of a black powder firearm should be de-cocked and if a percussion cap is present, it should be removed from the nipple (if possible). It is important to note that some black powder firearms can be considered low order explosives and should be treated as such.
5. If possible, do not cycle the firearm's action while rendering it safe.

## 16.2 Search for Firearms Evidence

Methods for locating firearms evidence include but are not limited to general visual searches, visual searches with different types of illumination and visual searches with magnification. Impact sites are located through visual search and may also necessitate chemical testing. In addition to visual searches metal detectors, X-ray equipment (Bomb Squad), canines and other MSP assets may also be used to assist with locating firearms evidence.

## 16.3 Documentation/Collection/Packaging of Firearms Evidence

Firearms evidence should be documented in the notes and photographed appropriately. Overall, midrange and close-up photographs should be taken to document the location of firearms evidence and its relationship to other items within the scene.

If the firearm has been moved from its original location, removed from the scene, and/or rendered safe by someone other than CSRT personnel prior to their arrival, the reported original condition, associated ammunition components, location moved from/to, as well as any personnel involved should be documented.

Additional close-up photographs and notes should be taken to document the following, if available:

- Location
- Make
- Model
- Caliber
- Serial Number
- Condition, including:
  - Position of
    - Any visible safeties
    - Hammer position (cocked, half-cocked, forward)
    - Action (open or closed)
    - Presence or absence of a cartridge/casing in the chamber

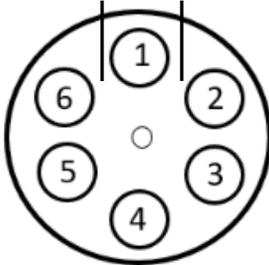
### 16.3.1 Documentation and Photography of Revolvers

In addition to the information listed in Section 16.3 of this manual, the following steps should be taken to document revolvers at a crime scene:

1. Mark the cylinder on both sides of the top strap prior to releasing it from the frame.
2. Open the cylinder of the revolver or remove it from the frame.
3. Document and photograph the chamber position, condition of ammunition and cartridge headstamp as shown below.

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Mark both sides of cylinder  
under top strap



<u>Chamber Position</u>	<u>Condition</u>	<u>Cartridge Headstamp</u>
1	Fired	9mm Luger FC
2	Fired	9mm Luger WIN
3	Unfired	9mm Luger WIN
4	Unfired	9mm Luger SIG
5	Unfired	9mm Luger SIG
6	Unfired	9mm Luger FC

### 16.3.2 Documentation and Photography of Pistols and Long Guns

In addition to the information listed in Section 16.2 of this manual, the following steps should be taken to document pistols and long guns at a crime scene, when applicable:

1. Release the magazine (if one is present) and open the action of the firearm
2. Remove any ammunition from the chamber
3. Document and photograph the ammunition removed from the chamber and any additional ammunition removed from the firearm. This should be done separately to show where the cartridges were removed from.



### 16.3.3 Documentation and Photography of Other Firearms Evidence

#### Types of evidence

- Fired Cartridge Cases
- Fired Bullets/Metal Jackets/Lead Cores
- Metal Fragments
- Fired Shotshells

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- Shot Pellets/Wads
- Unfired Ammunition

Thoroughly document the locations and types of each firearm evidence item and photograph each item prior to collection.

Additional considerations for documentation:

- Document and photograph the information on the headstamp of fired cartridge cases and shotshells. This information can assist in determining which firearms and unfired ammunition to collect.
- Fired evidence items may be individually itemized or documented as a group when several similar items are in the same location (e.g. shotgun pellets, metallic fragments collected from the same area, unfired ammunition, etc.).

## 16.4 Collection and Packaging of Firearms

The following are general principles and methods associated with the collection, preservation and proper packaging of firearms at the crime scene:

- Fragile or easily lost trace evidence observed on firearms should be removed and collected separately
- Any evidence with possible blood or biological material should be air-dried prior to packaging, placed in paper/cardboard to fully dry, and the packaging identified as a biohazard
- Firearms should be packaged in a rigid container (gun box), when possible. If examinations such as latent prints and/or DNA are needed, the firearm should be secured to the evidence container to minimize movement during transport. A zip tie may be used to secure the firearm evidence.
- Any firearm magazines should be packaged with their associated firearm (if recovered together).
- If cartridges were recovered with the firearm and/or magazine, they can be packaged with the firearm. Cartridges do not need to be removed from the magazine for packaging. However, all loose cartridges shall be secured and/or packaged separately within the firearm evidence container.

### 16.4.1 Revolvers

Fired and unfired cartridges removed from the cylinder of a revolver should be placed in envelopes that correspond to the marked chamber they were removed from. For example, a cartridge removed from chamber 1 should be placed in an envelope marked 1.

### 16.4.2 Pistols and Long Guns

Cartridges removed from the firearm should be placed in envelopes that correspond to the location they were removed from. For example, a cartridge removed from the chamber should be placed in an envelope marked "chamber" whereas cartridges removed from a magazine (if removed) should be placed in an envelope marked "from magazine". Cartridges removed from a magazine should be packaged together.

### 16.4.3 Collection and Packaging of Firearms Located in Water

For firearms recovered from water, collect a sample of the water into a container along with the firearm to minimize oxidation (if possible, keeping the firearm submerged at all times). The weapon should still be rendered safe when possible.

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## 16.4.4 Collection and Packaging of Other Firearms Evidence

*Some fired evidence has sharp edges that can puncture the skin. Handle all fired evidence with care.*

*Safety precautions shall be taken when using power and hand tools. When using tools where hazards to the eye could be created, safety glasses shall be worn.*

*Precautions should also be taken when altering/damaging surfaces where utilities or other hazardous materials (e.g., asbestos) may be present.*

*Other considerations include sharp surfaces and tools where gloves should be worn, and loud noises where hearing protection should be worn.*

Carefully collect fired and unfired evidence (e.g., bullets, bullet fragments, cartridges, cartridge cases, shotshells, shotshell components, slugs, unfired ammunition, etc.) with gloved fingers or plastic forceps and package in small paper envelopes (if available). Additional analysis (e.g. biology, trace, etc.) should be taken into consideration when collecting firearms related evidence.

### 16.4.4.1 Fired Projectiles

Fired projectiles may include fired bullets, bullet jacket fragments, lead fragments, lead cores, shotgun slugs, pellets, and wads, and other types of uncommonly loaded shotgun projectiles (chain, nails, flechettes, etc.). If collecting the fired projectile requires creating additional damage to a structure, or if the potential damage created to a surface outweighs the need for collection of the fired projectile, collection is left to the discretion of the investigating agency and CSRT leader.

When it is determined not to collect a fired projectile(s), it shall be documented in the notes.

If the fired projectile is embedded in a static surface, either remove the portion of the surface that contains the bullet or fragment OR extract the bullet or fragment from the surface without creating additional marks or damage to the fired projectile.

If the fired projectile is embedded in a portable object, collect the object at the scene. Document the location, orientation, and photograph the object before collection. If the object is too large to fully package, protect the area with the embedded fired projectile by covering the area with paper or a deconstructed cardboard box.

## 16.4.5 Collection and Packaging of Items for Distance Determination

Depending on the scenario, items within a crime scene may need to be collected for a distance determination examination. Below is a list of items needed for this examination and proper collection techniques for such items:

### 16.4.5.1 Victim's Clothing Items Exhibiting Bullet Holes

Victim's clothing items exhibiting bullet holes are the most common type of evidence collected for distance determination. If the victim's clothing is collected for a distance determination examination, only the outermost layer should be submitted. All items collected for this examination should be packaged to avoid loss of gunshot residues on the surface(s) suspected of supporting them.

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1. Clothing should be dried before packaging whenever possible and packaged to protect the impact sites that may contain gunshot residue.
2. Lay the garment flat on paper.
3. Lay another sheet of paper on the garment.
4. Roll up the paper with the garment sandwiched in between and place in a paper bag or other appropriate container.
5. Other items collected for distance determination should be packaged to avoid loss of gunshot residues on the surface(s) suspected of supporting them.

The following additional evidence should also be collected when available.

1. Any fired ammunition components and any similar ammunition found.
2. Any firearms suspected of having been involved.

#### **16.4.5.2 Gunshot Residue Analysis**

Testing for the presence of gunshot residue on “shooters” (e.g. clothing, hands, surfaces) is not performed by MSP FSD laboratories. If necessary, these items can be collected and turned over to the investigating agency for them to submit to a laboratory that conducts this type of analysis.

See Laboratory Operations Manual for additional submission policy guidelines related to gunshot residue evidence.

### **16.5 Trajectory Documentation**

Analysis of a shooting incident thru the identification, documentation and examination of projectile impact sites can assist with an investigation and be utilized for trajectory analysis in the future.

Shooting incident scenes and evidence are dynamic and varied. The following procedures are a starting point covering the basic equipment and techniques often used for documenting shooting incident scenes. Additional equipment and techniques may be necessary to meet the needs of a specific situation.

#### **16.5.1 Impact Sites**

Impact sites should be examined closely for the presence of trace materials from the projectile, transfer of rifling impressions, directionality and any other information that could assist with analysis of the shooting event. If transferred rifling impressions are observed, a cast of the impact site should be made using a silicon casting medium (see Section 17.0 of this manual).

##### **16.5.1.1 Impact Site(s) Documentation**

1. Locate and determine initial impact sites
2. Utilize a trajectory rod to identify other impact sites that may be associated from the same projectile when possible
  - a. Label impact site(s) with unique identifier(s) so they can be associated if they could be from the same projectile
3. Measure and document the location of each impact site
4. Photograph the impact sites (establishing, mid-range and close-up)



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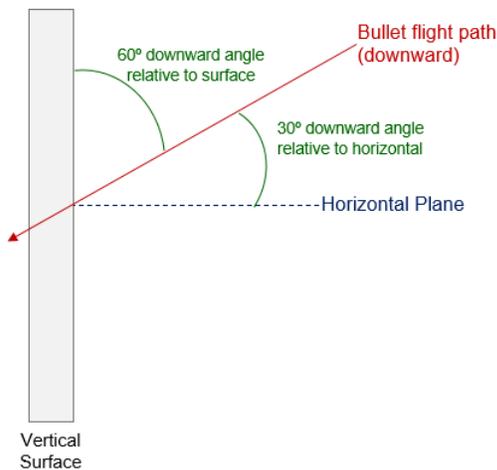
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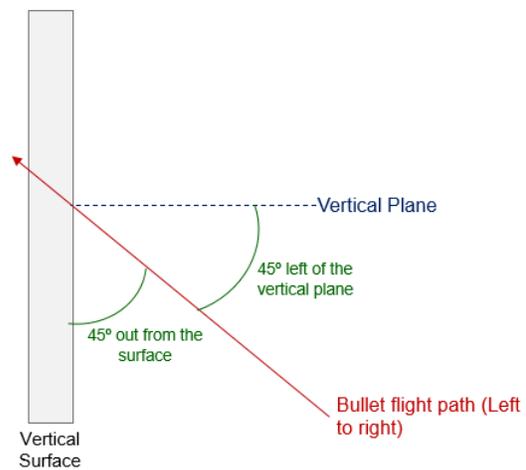
### 16.5.2 Projectile Trajectory

1. Carefully insert an appropriate trajectory rod into the entry hole (and associated exit hole, if applicable)
  - a. Utilize a centering cone if necessary to help stabilize the rod (entrance and exit, if applicable)
2. Confirm that the rod is passing through the correct holes/impact sites
3. Measure the horizontal angle of the trajectory rod
  - a. Document the angle in the notes (drawing a diagram can assist – see example below)
4. Measure the vertical angle of the trajectory rod
  - a. Document the angle in the notes (drawing a diagram can assist – see example below)
5. Photograph the holes with trajectory rods inserted
6. If deemed necessary, a laser can be attached to the end of the trajectory rod to project/extend the trajectory in either direction
  - a. If using a laser to document the trajectory, it can be photographed as described in Section 11.6 of this manual.

Side-View of Vertical Surface



Top-View of Vertical Surface



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## 17.0 Impression Evidence

Impression evidence is a generic term that encompasses impressions that may be created by any object at a crime scene including but not limited to fingers, palms, bare feet, footwear (e.g., shoes and boots), tires, tools and fabrics. This section of the manual is primarily detailing procedures for footwear and tire impressions but can also be applied to other similar types of impression evidence.

Impression evidence of all types can generally be treated similarly for documentation, collection and packaging. The collection process at a crime scene can include general photography, examination quality photography, processing, lifting and/or casting.

At the crime scene, a request should be made for elimination photographs of the bottoms of the shoes of persons and tires of vehicles that had legitimate access to the crime scene and may have left impressions within it. Elimination of questioned impressions should be done conservatively and if there is any doubt, proceed with documentation/photography/collection.

### 17.0.1 Friction Ridge Impressions

Friction ridge impression evidence is covered in Section 18.0 of this manual.

### 17.0.2 Toolmark Impressions

Toolmark impressions are typically processed differently than the other types of impressions detailed in this section. The location and orientation of the toolmark(s) should be documented and photographed. Examination quality photography is typically not necessary for toolmarks. The item supporting the toolmark(s) should then be collected and/or the toolmark(s) should be casted as described in section 17.3.3 below.

## 17.1 Search and Processing of Impression Evidence

Methods for detecting impression evidence include but are not limited to general visual searches and visual searches with different types of illumination (bright light, oblique light, alternate light sources). Physical and chemical processing can also be used to detect/enhance some types of visible and latent impressions.

Portable items suspected of supporting latent impressions (e.g., paper products, glass, etc.) should be collected and brought back to the laboratory for processing.

### 17.1.1 Physical Processing

#### 17.1.1.1 Oblique Light

One of the most useful techniques for detecting, enhancing and photographing some types of impression evidence is the use of oblique light.

1. Shine the light obliquely across relevant surfaces and visually search for impressions
  - a. The person searching may need to vary the position of the light source and their viewing position to reveal impressions
2. Mark any possible impressions that are revealed

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### 17.1.1.2 Alternate Light Source (ALS)

Some types of impressions may be detected and/or enhanced by the use of a specific wavelength of light and appropriate colored goggles/filter. See the Section 25 of this procedures manual for proper operation of an ALS.

### 17.1.1.3 Fingerprint Powders

Fingerprint powders can reveal impressions that are not visible by any other technique. They should not be used for dusty and/or dry residue impressions.

#### 17.1.1.3.1 Magnetic Powder Application Process

1. Pour needed amount of powder into a disposable container (piece of paper, paper bag, etc.)
2. Place the applicator with magnet engaged near or in contact with the powder to create a brush-like clump on the end of the applicator
3. Apply in a circular or sweeping motion to the surface making sure that only the tips of the powder clump touch the surface
4. If impressions develop, carefully enhance each until the impression is fully developed taking care to stop if damage/deterioration is noted during application
5. EQ photograph and lift impressions that develop

#### 17.1.1.3.2 Nonmagnetic Powder Application Process

1. Pour needed amount of powder into a disposable container
2. Dip the tips of the brush, cotton wad or Swiffer duster into the pile of powder
3. Shake off excess powder
4. Apply the powder to the surface with a circular or sweeping motion making sure that only the tips of the brush/cotton/duster contact the surface
5. If impressions develop, use the brush/cotton/duster to further enhance each until the impression is fully developed taking care to stop if damage/deterioration is noted during application
6. Photograph and lift impressions that develop

### 17.1.1.4 Paints and Powders for 3D Impressions

Three dimensional Impressions in very dark and very light substrates may be difficult to photograph and adding a contrasting color may assist with visualization and photography.

#### 17.1.1.4.1 Spray Paints/Wax

1. Hold the can a distance away from the impression (approximately 1-2ft)
2. Spray above the impression to allow it to fall into the impression
  - a. If conditions are windy, it may be necessary to spray directly into the impression taking care to not destroy/alter the impression
3. The impression should be coated from all directions/sides to ensure all sides of the impression are coated
4. Apply multiple layers/coats as necessary

#### 17.1.1.4.2 Powders

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1. Hold the atomizer a distance away from the impression (approximately 1ft)
2. Puff/spray the powder above the impression to allow it to fall into the impression
  - a. If conditions are windy, it may be necessary to puff/spray directly into the impression (taking care to not destroy/alter the impression)
3. The impression should be coated from all directions/sides to ensure all sides of the impression are coated
4. Apply multiple layers/coats as necessary

#### **17.1.1.4.3 Other Paints/Powders**

Other paints/powders may be applicable, and their use is left to the discretion of the analyst performing the impression evidence processing.

#### **17.1.2 Chemical Processing**

Chemical processing employed at the crime scene shall adhere to the procedures and requirements detailed in Section 5.0 of this procedures manual. There are a variety of chemicals found in section 5.0 of this manual that can be utilized for processing impression evidence.

Other chemical processing techniques utilized in the laboratory exist that may be utilized for impression evidence at the crime scene. It is left to the discretion of the analyst responsible for the evidence type at the crime scene to determine if one of these other chemical processing techniques should be used at the crime scene. Please refer to and follow the instructions in discipline specific laboratory procedures manuals when employing other chemical processing techniques at the crime scene.

### **17.2 Photography of Impression Evidence**

All impressions of sufficient quality should be photographed to establish their location and also for examination quality following the procedures detailed in photography section of this procedures manual.

It is not necessary to photograph toolmarks for examination quality.

### **17.3 Casting of Impression Evidence**

Whenever possible, three dimensional impressions detected at the crime scene should be cast after they are photographed. The decision of which impressions to cast is left to the discretion of the analyst performing the impression evidence processing at the crime scene.

#### **17.3.1 Dental Stone**

Dental stone is an ideal casting medium for three-dimensional footwear and tire impressions. There are a variety of brands and types available and it is left to the discretion of the laboratory and/or analyst to pick the brand/type they prefer.

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### 17.3.1.1 Preparation of Impression

1. If on a slope, use frame around impression or build dirt embankment around impression
2. For snow impressions, coat impression(s) with snow print wax or spray paint primer

### 17.3.1.2 Mixing

1. Add appropriate amount of water to bag containing dental stone
2. Seal the container or hold upright and closed to avoid spillage
3. Knead/Mix thoroughly for approximately 3 to 5 minutes
4. Confirm no lumps or dry powder remains (check corners of bag) and the consistency is that of pancake batter

### 17.3.1.3 Pouring

1. With the opening of the container slightly above the top of to the impression, start pouring just off of the end of the impression and carefully move the opening of the container so the dental stone flows into the impression
2. As the dental stone spreads to the outer edges of the impression, slowly move the bag/container forward down the center of the impression allowing time for the mixture to spread out to the edges of the impression
3. Continue slowly moving the bag until the end of the impression is reached and it is completely filled with dental stone
  - a. If the mixture is too thick and not flowing carefully agitate the surface to help spread it out

### 17.3.1.4 Removal/Packaging

1. Remove the hardened cast by carefully lifting at the edge
2. The cast can be photographed for examination quality at the scene if necessary
  - a. The identification tag used in the photograph shall be labeled “cast” because the impression is reversed
3. Place the hardened cast (impression side of the cast facing up) in a box or other suitable container

### 17.3.1.5 Casting Large Impressions

If one bag of dental stone does not fill the entire impression, follow the steps above for dental stone, but mix the appropriate amount of dental stone in a bucket or large container by first adding the water and then slowly adding the powder to the water while mixing. When pouring the mixture from the bucket into the impression, a piece of cardboard or other item may be needed to “deflect” the pour to protect the impression.

### 17.3.1.6 Casting in Cold Weather and Snow

If available, SnowStone should be considered and used to cast snow impressions. See Section 17.3.2 below.

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**17.3.1.6.1 Preparation of Snow Impression (not necessary for impressions in dirt/mud/sand/etc.)**

1. Add multiple coats/layers of snow print wax or spray paint primer

**17.3.1.6.2 Mixing**

1. Add heaping tablespoon of potassium sulfate to the bag of dry dental stone
2. Measure water into measuring cup, add snow and stir to get water as cold as possible (may have to dump out excess water after adding snow)
3. Add slightly less water to bag containing dental stone than normal (thicker mixture helps reduce dental stone from seeping through porous snow)
4. Mix as stated in above casting procedures

**17.3.1.6.3 Pouring**

Pour as described above in section 17.3.1.3.

**17.3.1.6.4 Removal/Packaging**

Remove and package as described above in section 17.3.1.4.

**17.3.1.7 Wet Snow/Slush**

**17.3.1.7.1 Dry Casting Application**

1. Carefully sift a thin layer of dry dental stone (approximately 1/8in)
2. Spray a fine mist of water onto the layer of dental stone
  - a. If impression was excessively wet, the mist of water may not be necessary. Observe the impression and if the layer of dry dental stone absorbs enough water from the snow it is not necessary to spray with a mist of water.
3. Allow approximately 4 to 5 minutes for the water to absorb into the dental stone
4. Repeat steps 1 – 3 until pattern area of impression is covered
5. Mix a bag of dental stone as described above in 17.3.1.6 section (not using snow print wax or primer) and carefully pour on top of the dry casted dental stone

Follow remaining procedures for casting in above section 17.3.1.

**17.3.1.8 Casting Impressions Under Water**

**17.3.1.8.1 Preparation of Impression**

1. If possible, use a frame that extends above the water line
2. Carefully place frame around impression leaving a minimum of 2in extra space on all sides
3. Extreme care should be taken to avoid disturbing the impression

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### 17.3.1.8.2 Casting Application

1. Carefully sift a layer of dry dental stone into the impression (approximately 1in thick)
2. Allow approximately 4 to 5 minutes for the dry dental stone to settle into the impression
3. Mix a sufficient amount of dental stone to create a layer approximately 2in thick and carefully pour into the framed area

Follow remaining procedures for removal/packaging above in section 17.3.1.

### 17.3.2 SnowStone

#### 17.3.2.1 Preparation of Impression

1. Sift approximately 10% dry SnowStone powder into the impression to create a base layer over the entire impression

#### 17.3.2.2 Mixing

1. Add water to the SnowStone bucket to the fill line
2. Add the SnowStone powder to the bucket of water
3. Mix for approximately 45 seconds (if mixed too much longer it can harden in the bucket)

#### 17.3.2.3 Pouring

1. Carefully pour entire mixture into the impression similarly to dental stone above
2. Allow it to harden for 8 to 10 minutes

Follow remaining procedures for removal/packaging above in section 17.3.1.

### 17.3.3 Silicon Casting/Lifting Mediums

AccuTrans is a casting/lifting medium typically used for toolmarks but can be used to cast or lift other types of impressions when applicable.

#### 17.3.3.1 AccuTrans

1. Apply a thick layer of the product into the impression by squeezing the trigger of the dispenser
2. The Accutrans should spread out on its own, but the mixing tip can be carefully swirled in the pool of material to aid it in spreading out
3. A tongue depressor or gloved finger can also be used to spread/press the product into the impression and remove air pockets
4. Allow sufficient time for the product to harden and carefully remove and place a clear backer or protective cover over the side with the impression
5. Place in an envelope or other appropriate container that protects it

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## 17.4 Lifting of Impression Evidence

Two dimensional impressions detected at the crime scene should be lifted. The decision of which impressions to lift is left to the discretion of the analyst performing the impression evidence processing at the crime scene.

### 17.4.1 Electrostatic Lifter (ESL)

Electrostatic lifting film is typically used for dry origin type impressions and can be used to lift single impressions and/or large areas of these types of impressions. ESL is the least destructive technique for lifting these types of impressions and if it is not successful, other lifting techniques may be able to be employed.

#### 17.4.1.1 Lifting

1. Carefully place lifting film over the area supporting the impression(s)
  - a. If on a vertical surface, secure the lifting film with a piece of tape
2. Place grounding plate next to, but not touching, the lifting film (within 2 inches)
3. Place the ESL device (turned off) on the film and ground plate with the two grounding prongs touching the grounding plate and the high voltage prong on metallic side of the lifting film
4. Switch on the ESL device and turn the knob clockwise until the film achieves maximum adhesion to the surface
5. Use a foam paint brush or fingerprint ink roller to lightly smooth out air bubbles
6. Switch the ESL device off and remove it from the film (do not touch high voltage prong as residual charge may still exist)

#### 17.4.1.2 Removal/Packaging

1. Remove the lifting film by carefully peeling it from the surface
2. It is recommended to photograph it for examination quality at the scene and then package
3. The preferred packaging for ESL film is to tape it to the top of a cardboard box (black side facing out), so the impressions are not contacting anything
4. If the lift is small enough, it can be placed in a clean file folder (black side up) and secured with a small piece of tape

### 17.4.2 Gelatin Lifters

Gelatin lifters are a very versatile low adhesive lifting medium that can be used for lifting a variety of types of impression evidence.

#### 17.4.2.1 Lifting

1. Remove the plastic protective cover from the gelatin lifter
2. Allow the gelatin lifter to rest for 30 – 60 seconds after removal of the protective cover
3. Anchor an edge of the lifter near the edge of the impression (adhesive side down) aligned to cover the entire impression(s)
4. Roll the lifter onto the impression using the fingerprint ink roller or other object
5. Flatten the lifter onto the surface with the roller completely removing any air bubbles
6. Carefully label the back of the gelatin lifter with a felt tip marker (do not use pens or too much pressure)

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#### **17.4.2.2 Removal/Packaging**

1. Remove the gelatin lifter by carefully peeling it from the surface
2. The impression on the gelatin lifter can be photographed for examination quality at the scene if deemed necessary
  - a. The identification tag used in the photograph shall be labeled “gel lift” because the impression is reversed
3. The plastic protective cover should be placed back onto the gelatin side of the lifter
4. Multiple gelatin lifters can be packaged in any suitable container (i.e. paper bag, envelope, box, etc.)

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## 18.0 Friction Ridge Impression Evidence

Friction ridge impressions are created by the friction ridges of the palmar or plantar skin (fingers, palms, toes and soles of the feet). This type of impression evidence can generally be documented, collected and packaged similarly to other impression evidence discussed in Section 17.0 of this manual.

At the crime scene, a request should be made for elimination prints of persons that had legitimate access to the crime scene and may have deposited friction ridge impressions within it.

The processing techniques and order in which they are utilized is left to the discretion of the analyst at the scene and typically should move from the least invasive technique to the most invasive.

### 18.1 Search and Processing of Friction Ridge Impressions

Methods for detecting and processing friction ridge impressions at the crime scene include but are not limited to:

- Visual search (with magnification if necessary)
- Visual search with different types of illumination (e.g., flashlight, floodlight, oblique light, alternate light source, laser, etc.)
- Physical and chemical processing

The decision whether to process at the scene or back at the laboratory is left to the discretion of the analyst performing the friction ridge impression processing at the crime scene.

#### 18.1.1 Physical Processing

##### 18.1.1.1 Oblique Light

One of the most useful techniques for detecting, visualizing and photographing some types of friction ridge impressions is the use of oblique light.

1. Shine the light obliquely across relevant surfaces and visually search
  - a. The person searching may need to vary the position of the light source and their viewing position to reveal the impressions
2. Mark any possible impressions that are revealed

##### 18.1.1.2 Alternate Light Source (ALS)

Some types of impressions may be detected and/or enhanced by the use of a specific wavelength of light and appropriate colored goggles/filter. See Section 25 of this procedures manual for proper operation of an ALS.

##### 18.1.1.3 Powders

Fingerprint powders are one of the most common development/processing techniques utilized to reveal and develop latent friction ridge impressions at a crime scene. The type and color of powder selected is dependent on the type and color of the surface/item.

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*Powders applied in the field require appropriate safety precautions. Ventilation systems, dust masks, or respirators are advised to reduce/prevent inhalation of powders in confined or poorly ventilated spaces.*

#### **18.1.1.3.1 Traditional Powder Application Process**

1. Place the necessary amount of powder into a disposable container
2. Fan out the brush and dip the tips of the applicator (brush of cotton batting) into the powder
3. Shake off excess powder if too much is adhering to the brush
4. Apply the powder to the surface with a back and forth or circular motion of the applicator making sure that only the tips of it are making contact with the surface
5. As ridge structure develops, use the brush/cotton to further process while evaluating the print(s) quality until the desired contrast is achieved
6. Continue processing areas adjacent to developed print(s) for additional ridge structure related to those already developed

#### **18.1.1.3.2 Magnetic Powder Application Process**

1. Place the necessary amount of powder into a disposable container
2. Place the applicator with magnetic engaged near or in contact with the powder which creates a brush-like clump on the end of the applicator
3. Apply the powder to the surface with a back and forth or circular motion of the applicator making sure that only the tips of the powder clump touch the surface
4. As ridge structure develops, use the powder clump to further process while evaluating the print(s) quality until the desired contrast is achieved
5. Continue processing areas adjacent to developed print(s) for additional ridge structure related to those already developed

All friction ridge impressions of sufficient quality should be photographed for examination quality prior to lifting or collection.

### **18.1.2 Chemical Processing**

Chemical processing employed at the crime scene shall adhere to the procedures and requirements detailed in Section 5.0 of this procedures manual. There are a variety of chemicals found in section 5.0 of this manual that can be utilized for processing friction ridge impressions. In addition to those found in section 5.0, friction ridge impressions may be chemically processed with superglue fuming which is detailed in the following section.

Other chemical processing techniques utilized in the laboratory exist that may be utilized for friction ridge impressions at the crime scene. It is left to the discretion of the analyst responsible for the evidence type at the crime scene to determine if one of these other chemical processing techniques should be used at the crime scene. Please refer to and follow the instructions in discipline specific laboratory procedures manuals when employing other chemical processing techniques at the crime scene.

#### **18.1.2.1 Cyanoacrylate Ester (Superglue) Fuming**

Successful development of friction ridge impressions with cyanoacrylate ester fuming results in white colored ridge structure.

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*Do not inhale or allow the fumes to come into contact with your skin, eyes or airways. A respirator and enclosed eye protection shall be worn when opening the chamber*

#### 18.1.2.1.1 Equipment/Materials

- Fuming chamber (Rubbermaid tub with lid, aquarium or another chamber capable of being sealed air tight)
- Disposable aluminum dish
- Hot plate
- Liquid superglue
- Cup or dish for warm water
- Warm water
- Hot Shot Fingerprint Developer System

#### 18.1.2.1.2 Application Process

The application processing below is general in nature and variations may be necessary due to equipment available, size/nature of item being processed and other unforeseen situations. Please refer to the laboratory Latent Print Procedures Manual for further information on this topic if necessary.

#### Portable Fuming Chamber Application Process

1. Suspend or support the article(s) in the chamber
2. Place a control fingerprint on a substrate and place in chamber
3. Pour appropriate amount of superglue into a clean disposable aluminum dish
4. Place aluminum dish with superglue on the hot plate inside the chamber
5. Place container of warm water inside the chamber
6. Close the container and allow it to fume for approximately 5 to 15 minutes (dependent on the size of the chamber)
7. Exhaust the chamber

#### Large Item or Interior Vehicle Application Process

1. Create an enclosed space around the large item or area to be fumed
2. Place a control fingerprint on a substrate and place it inside of the enclosed space/vehicle

If Hot Shot Fingerprint Developer is available, follow steps 3 through 8 below. If not, revert to steps 3 through 7 of the "Portable Fuming Chamber Application Process" above.

1. Place the necessary number of Hot Shot Fingerprint Developer cups in the enclosed space
2. Add the activator solution to each of the HotShot cups
3. Puncture a hole in the bottom of the heat canister and place it (hole side down) into the cup containing the activator solution
4. Add the super glue to the top of the heat canister
5. Seal the space/vehicle and allow the fumes to develop any latent prints
6. Exhaust the chamber

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## 18.2 Photography of Friction Ridge Impression Evidence

All fingerprints that are of sufficient quality should be photographed to establish their location and also for examination quality. In some instances, it may be warranted to photograph for examination quality throughout the development process.

## 18.3 Lifting/Casting of Friction Ridge Impression Evidence

Friction ridge impressions should be lifted/cast when possible after being photographed. There are a variety of mediums that can be used to lift.

### 18.3.1 Tape/Adhesive Lift

Clear tape is the preferred technique for lifting ridge structure developed with fingerprint powders on smooth non-porous surfaces. Other adhesive lifting mediums exist that may be used. The instructions with these other mediums should be followed. The lifting medium chosen is left to the discretion of the analyst.

#### 18.3.1.1 Lifting

1. In a smooth and continuous motion, remove a section of tape large enough to lift the impression(s)
2. Anchor the tape near the edge of the area to be lifted
3. Using your finger or squeegee to smooth the tape (adhesive side down) over the impression
4. Remove the tape from the surface in a smooth continuous motion
  - a. Removing the tape from the end opposite the roll is advantageous because the weight of the roll helps keep the tape from curling up on itself
5. Apply the tape containing the impression onto a clear plastic or solid color backer similarly to steps 2 - 3 above
6. Label the lift with case information

#### 18.3.1.2 Packaging

The lift(s) can be packaged in an envelope or other appropriately sized container. Multiple lifts from the same crime scene or specific areas of the crime scene should be packaged together.

### 18.3.2 Gelatin Lifters

Gelatin lifters are a low adhesive lifting sheet available in different sizes and colors (black, white and clear). These types of lifters are primarily used for friction ridge impressions on textured/rough/uneven surfaces, but can be used to lift most friction ridge impressions on most substrates.

#### 18.3.2.1 Lifting

1. Remove the plastic protective cover from the gelatin lifter
2. Allow the gelatin lifter to rest for 30 – 60 seconds after removal of the protective cover
3. Anchor an edge of the lifter near the edge of the impression (adhesive side down)
4. Roll the lifter onto the impression using the fingerprint ink roller or other object
5. Carefully label the back of the gelatin lifter (do not use pens or too much pressure)

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### 18.3.2.2 Removal/Packaging

1. Remove the gelatin lifter by carefully peeling it from the surface
2. The impression on the gelatin lifter can be EQ photographed at the scene if necessary
  - a. The identification tag used in the photograph shall be labeled “gel lift” because the impression is reversed
3. Place the plastic protective cover back onto the gelatin side of the lifter
4. Multiple gelatin lifters can be packaged in any suitable container (i.e. paper bag, envelope, box, etc.)

### 18.3.3 Silicon Lifting/Casting Mediums

Accutrans and Mikrosil are lifting/casting mediums that can be used to lift friction ridge impressions developed with fingerprint powder after they are photographed. These mediums are primarily used for impressions on textured/rough/uneven surfaces but can be used to lift most impressions on most substrates.

#### 18.3.3.1 AccuTrans

1. Apply a thick layer of the product onto the surface supporting the ridge structure by squeezing the trigger of the dispenser
2. The Accutrans should spread out on its own, but the mixing tip can be carefully swirled in the pool of material to aid it in spreading out taking care not to contact the surface with the impression
3. Allow sufficient time for the material to harden and carefully peel it from the surface

#### 18.3.3.3 Packaging

Apply a transparent backer over the lift/cast and place each lift/cast in a separate envelope or other suitable container that protects it.

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## 19.0 Questioned Documents

Questioned documents are considered anything that conveys a message. When documents (e.g., pads of paper, notes, letters, etc.) or equipment capable of producing documents (e.g., printers, typewriters, fax machines, etc.) are encountered within a crime scene consideration should be given to whether they may have forensic value. If there is a possibility that they may have value, they should be documented and collected.

The Questioned Documents Unit processes and analyzes the following evidence types:

- Writing and printing
- Impressions / Impressed writing/typing
- Inks
- Paper (charred, faded, shredded, obliterated or liquid soaked / submerged documents)
- Printers, fax machines, photocopiers, other mechanical devices
- Typewriters, ribbons and correction materials
- Graffiti

### 19.1 Search for Questioned Document Evidence

The primary method of search for questioned documents and equipment that could produce questioned documents is visual search. Alternate light sources (ALS) may also aid in locating obliterated or latent messages on different surfaces/substrates. See Section 19 of this manual for ALS procedures.

### 19.2 Collection/Packaging of Questioned Document Evidence

As with any type of evidence, questioned documents and equipment should be photographed appropriately prior to collection.

*When collecting questioned document evidence, the container should only be written **before** the evidence is placed inside of it.*

When impressed writing may be present, it is preferred to place the document between layers of cardboard before packaging. If initialing the evidence seal after the evidence is inside, it should be done with a felt tip marker utilizing very light pressure to avoid impressing the evidence inside.

**Water-soaked documents** should be packaged in the water they are recovered from in a sealable container of sufficient size/capacity to keep the document(s) submerged. This container and contents should then be frozen and submitted frozen.

**Charred documents** are extremely fragile and should be sandwiched between layers of cotton inside a cardboard box. A piece of cardboard or other spatula-type device can be used to carefully pick up charred documents.

If the questioned writing is on a permanent surface that cannot be collected, it should be photographed for examination quality.

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## 20.0 Trace Evidence

Trace evidence is a generic term for small, often microscopic material but can include a wide variety of evidence types. Typical trace evidence encountered at crime scenes may include but is not limited to:

Fibers	Fractured materials
Glass	Fire debris
Paint	Explosives

Other less usual trace evidence may include:

Acids/Bases	Metal fragments
Adulterants/poisons	Plastic/polymers
Bank dye	Powder analysis
Building materials (drywall, concrete, insulation, etc.)	Safe insulation
Cable (zip) ties	Soil
Cosmetics	Tape
Engine oil and gasoline contamination	Unknown substances
Ethylene glycol	Wood identification
Feather	Vehicle air bags
Lubricants	

*Some types of trace evidence (fibers, feathers, microscopic particles) can easily cross contaminate between samples so care should be taken to prevent cross contamination.*

The Trace Evidence Procedures Manual provides information in addition to what is provided below and is available for your review.

### 20.1 Search for Trace Evidence

Methods for detecting trace evidence include but are not limited to general visual searches, visual searches with different types of illumination (bright light, oblique light, alternate light sources) and visual searches with light and magnification.

When processing missing person and/or homicide crime scenes where a body has not been located, a search for known samples of materials should be completed. These known samples could be trace evidence that transferred to the body (e.g., carpet fibers, pet hair, etc.) or materials that could have been used to conceal the body (e.g., ligatures, adhesive tape, garbage bags, tarps, etc.).

A trace evidence search/collection checklist is available to assist with locating and collecting trace evidence.

### 20.2 Collection/Packaging of Trace Evidence

The number and types of trace evidence collected is based on several factors including but not limited to the type of case, nature of the crime scene and relationship between the victim and suspect.

Questioned and known samples should never be packaged together. Packaging mediums should be selected that avoid loss of evidence through seams and unsealed gaps.

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## 20.2.1 Fiber Evidence Collection and Packaging

Tape lifts from all decedent(s)/victim(s) and known carpet/rug fibers should be collected at all crime scenes unless case details deem trace evidence on the victim and known fibers to be of no value.

### 20.2.1.1 Known Fibers

1. Whenever possible submission of the entire fiber source (clothing articles) is preferred
2. Cut out a representative sample(s) of the source/item
  - a. If areas of the item are visually different (different colors, faded areas, worn sections, etc.) the sample should contain fibers from each area
3. Place small samples into a paper packet
4. Place larger articles in paper bags or envelopes

### 20.2.1.2 Known Carpet/Rug

#### 20.2.1.2.1 Known Carpet/Rug Collection Process (bundle of fibers)

1. Grasp sample of fibers with gloved fingers or forceps
2. Cut several tufts of fibers near the base of the carpet/rug
  - a. If areas of the carpet/rug are visually different (different colors, faded areas, worn sections, etc.) the sample should contain fibers from each area
3. Place sample(s) in a paper packet or other appropriate container

#### 20.2.1.2.2 Known Carpet/Rug Collection Process (carpet square)

1. Cut out square of carpet/rug including backing and place in envelope or appropriate paper container
  - a. If carpet/rug is multiple colors, make sure the sample contains samples of each color

### 20.2.1.3 Fiber Picking

1. Fibers can be removed with fingers, forceps or post-it note adhesive being very careful not to distort the fiber(s) shape
2. Place the fibers in a paper packet or onto the adhesive of a post-it note and then fold it and place in a paper packet or other appropriate container

### 20.2.1.4 Adhesive Lifts

1. Contact the adhesive side of the tape to the surface of interest, lift and repeat until entire surface has been lifted
  - a. Do not overuse the tape as it loses its adhesive properties
  - b. Additional tape lifts may be necessary depending on the size and nature of the substrate being tape lifted
2. Carefully smooth the tape (adhesive side down) onto transparency or other clear plastic substrate
  - a. If areas are not adhering to the transparency, tape them down with additional tape
3. Label the transparency next to the piece of tape with the area that it was collected from (e.g., front of shirt, seat bottom, etc.)

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For situations where the adhesive of book tape may be too strong (e.g., decomposed skin), post-it notes can be used to lift fibers and trace evidence. The post-it notes can be folded to capture the fibers and other trace evidence and placed in a paper packet or other appropriate container.

### 20.2.1.5 Vacuum Sweeping

1. Connect a new filter nozzle and vacuum the area of interest (multiple filter nozzles may be utilized depending on the amount of debris on the surface being vacuumed)
  - a. Each filter nozzle should be labeled with location the sample came from
2. Carefully remove the filter nozzle to avoid losing trace evidence inside
3. Place the filter nozzle(s) in an appropriate container(s)

### 20.2.2 Fractured Evidence (Physical/Fracture Match) Collection and Packaging

A fracture match results when two pieces of fractured/torn materials are reconstructed to form a continuous section or single object. Any broken/torn items observed at a crime scene should be examined and a search should be performed to determine if all broken parts that make up the object can be accounted for. If they cannot or there is any doubt that some portion is missing, the broken item and/or pieces should be collected. These items can be packaged in a paper bag or other appropriate container. If the items are fragile and could be damaged or broken further, they should be packaged separately and carefully to avoid further damage.

### 20.2.3 Glass Evidence Collection and Packaging

Broken glass at a crime scene can be used to link people to the crime scene and should be collected. Glass evidence can be collected with a variety of techniques including picking, adhesive lifts and vacuum sweeping.

Each known source of glass that is broken should have a known sample collected and package separately. Containers should not have any open seams where fragments could fall out (paper packets, plastic petri dishes, plastic bags).

1. Whenever possible collect at least five full thickness fragments directly from the source of broken glass (directly from the window and not from the ground)
  - a. If multiple windows or glass items are damaged, samples should be collected from each source and packaged separately
  - b. Dual pane windows and glass sources should have two separate samples collected from each pane and labeled to reflect this
2. Place the sample in a paper packet or other appropriate container

### 20.2.4 Paint Evidence Collection and Packaging

Painted surfaces can transfer paint to items that come in contact with it. Paint samples should be collected from any areas within a crime scene where a transfer could have taken place.

#### Paint Collection Process

1. Carefully pick/gouge/scrape a sample of the paint making sure to get all layers of paint down to the substrate the paint is covering
2. The sample should combine to be at least 0.25in to 0.5in square
3. If the substrate is soft (plastic, wood, fiberglass), cut into the substrate and include it

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### Paint Smear Collection Process

1. Carefully scrape the entire smear off the surface into a paper packet
2. If the substrate is soft (plastic, wood, fiberglass), cut out the area with the smear

## 20.2.5 Fire Debris and Explosives Evidence Collection and Packaging

### 20.2.5.1 Fire Debris

Fire debris evidence is evidence from a suspected arson crime scene that may have accelerant present (e.g., gasoline, alcohol, light fluid, oil, etc.).

*A fire investigator should be requested or consulted to assist with the search and collection of this type of evidence.*

#### Fire Debris Collection Process

1. Scoop solid debris (dirt, sand, ashes, etc.) and dump into appropriate container (e.g., nylon bag, metal can)
2. Cut/Remove permanent items (carpet, wood flooring, car seats, etc.) and place in appropriate container
3. Absorb liquid pools/puddles into sterile absorbent material and place in appropriate container
4. Carefully remove small sample of suspected known accelerants and transfer to appropriate container
5. Seal all containers airtight immediately to avoid loss of volatile components

Evidence should not be dried prior to packaging and sealing airtight.

*Soil samples collected should be refrigerator or frozen at your earliest convenience to avoid breakdown of potential accelerants.*

### 20.2.5.2 Explosives

Explosives evidence could be in the form of an improvised explosive device or some type of powder or substance used to cause an explosion.

*The bomb squad shall be contacted and involved with any and all searches and collection of explosive materials.*

## 20.2.6 Other Trace Evidence Collection and Packaging Techniques

Whenever possible, known/reference samples should be collected if they could be the source of any of these other trace evidence types.

For missing person and body dump cases, consideration should be given to collecting known/reference samples of items that may have been used to transport and/or conceal the body (tarps, garbage bags, tape, cords/rope, etc.).

### 20.2.6.1 Light Filaments

Light filaments can be damaged during the commission of a crime and can be examined microscopically to determine if they were on or off.

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1. Whenever possible cut the wires and remove the entire light assembly
2. Collect the bulb or assembly and secure it in the container to avoid excessive movement
3. If the portion of the bulb surrounding the filament is compromised exposing the filaments and supports, the base of the bulb can be securely placed in a cut in the bottom of a Styrofoam cup and then additional cups can be stacked to protect it (See images below).

### **20.2.6.2 Building Materials**

Damaged/loose building materials (e.g., drywall, safe insulation, brick, wood, metal, plaster, etc.) at a crime scene can be collected for comparison to debris that may have transferred to other people and/or objects.

#### **Known Building Material Collection Process**

1. Carefully collect a sample from each area or substrate that is damaged
2. If multiple areas of damage exist to the same substrate, samples should be collected from each
3. Place the sample in a paper packet or other appropriate container

#### **Questioned Building Material Collection Process**

1. Collect any objects/items that are suspected of having building material present on them
2. Place the object/item in an appropriate container the contains microscopic materials that may be present

### **20.2.6.3 Soil Collection**

Soil can transfer to suspects, victims and other objects during the commission of a crime.

#### **20.2.6.3.1 From the ground**

1. Dig out sample and carefully place in container
2. Clean the sample collection tool between each sample collection

#### **20.2.6.3.2 From a permanent item or item that is too large to collect**

1. Hold sample container below the soil stained area
2. Scrape the soil off and let it fall into the container
3. Collect a sufficient amount up to 1 cup of the sample

Items supporting potential soil evidence that can be collected and submitted should be packaged appropriately to avoid loss of soil and other microscopic materials.

### **20.2.6.4 Other Trace**

Because trace evidence can include a variety of other materials, a trace evidence analyst may need to be consulted. Collection techniques vary and may include scraping/cutting, swabbing, and/or collecting the entire item. When collecting unknown materials, an attempt to collect possible known samples for comparison is recommended.

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## 21.0 Body Processing

The victim(s) and/or decedent(s) are normally a source of a variety of types of forensic evidence. In some instances, evidence may also need to be collected from the suspect(s), witnesses and other living people. Most of the following procedures can be applied to living people as well. For search and collection of evidence not covered below, please consult the discipline specific procedures in the CSRT procedures manual.

Documentation and collection of evidence from the body is critical, and it should be completed as soon as feasible during the crime scene process to avoid loss of evidence and possible contamination. The applicable procedures and order they are performed is dictated by the nature of the scenario and location/condition of the body and left to the discretion of the CSRT Leader. These procedures may also be applicable for bodies processed at locations other than the crime scene (e.g., morgue, funeral home, police department, etc.).

*If the decedent has not been identified, the local MSP Post can be contacted to request a Trooper with Mobile ID to attempt to determine the identity of the decedent.*

*Significant manipulation and alteration of the decedent requires approval from Medical Examiner personnel when available as it could impact their examination of the body.*

### 21.1 Documentation and Photography of Body

The location, position and condition of the body should be documented in the notes along with other pertinent information listed in the FS-37 and/or FS-37a worksheet located on the FSD Forms Page. At a minimum, measurements for the position of the head, hands and feet should be recorded. Diagrams and/or sketches may also assist with the documentation of the location and position of the body.

The body should be photographed extensively to include their location, condition, clothing, injuries/apparent injuries, identifiable marks and bloodstain patterns. When the size of marks or stains are important, scales should be included, and it may be necessary to capture EQ images.

### 21.2 Search for Evidence from the Body

Fragile and/or transient evidence from the outer surfaces of the body and clothing that does not hinder the Medical Examiners autopsy of the body should be collected at the crime scene whenever possible to avoid loss/contamination during transport of the body from the crime scene.

*Orifices or wounds shall not be probed; the body shall not be processed by the application of foreign materials (physical or chemical processing); and clothing shall not be removed without prior approval from Medical Examiner personnel. Approval for such activities shall be documented in the notes.*

The body should be thoroughly searched at a minimum by visual examination with bright light to include hands, fingernails, face, hair and areas around apparent wounds. In situations where sexual assault is possible, an alternate light source should be used to examine the exterior surfaces of the body for foreign bodily fluids. Alternate light sources should also be considered to search the body for trace evidence or other foreign materials that may have transferred to the body (see Section 25).

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## 21.3 Collection of Evidence from the Body

Before evidence is collected from the body, consideration should be given to its impact on the autopsy of the decedent. For non-routine collection or processing not documented below, CSRT personnel should consult with the Medical Examiner's office or personnel when possible before collection is performed.

When evidence is removed/collected from the body, the Medical Examiner personnel that respond to the scene should be notified of what was collected to avoid duplication of effort.

Below are the typical evidence collection techniques utilized on bodies at the crime scene. For other evidence collection techniques not described below, please consult the discipline specific section of the CSRT procedures.

### 21.3.1 Trace Evidence

Trace evidence should be collected from exposed exterior surfaces of the body. Trace evidence may be especially critical in any situations where physical contact would be expected between the decedent and the suspect or the decedent and environments they could have been in prior to or after their death.

### 21.3.2 Biological Evidence

Bloodstains and other biological fluids that are detected and are deemed forensically significant should be collected. Areas that could support foreign cellular material (e.g., bite marks, fingernails, etc.) can also be collected. Below are additional areas on/around the body that can be considered for collection of cellular material:

- Neck and behind ears if manual strangulation is suspected
- Ends of ropes/ligatures/bindings
- Ankles/arms/wrists if victim appears to be dragged
- Turned out pockets that may have been rifled through
- Around stretched/torn areas of clothing
- Inner thighs and pubic bone if sexual assault suspected

### 21.3.3 Fingerprint Evidence

Prior to collecting fingerprint impressions/images, consideration should be given to utilizing Mobile ID.

Fingerprint impressions/images may be needed to assist with identifying the decedent to assist with the investigation. Before applying powder, ink or another foreign substance, the Medical Examiner should be consulted when available. Also, it is extremely important to collect other evidence types prior to the application of any foreign substance to the decedent's hands.

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### **21.3.4 Clothing with Bloodstain Patterns or Gunshot Residue for Distance Determination**

Clothing with essential bloodstain patterns and/or gunshot residue for distance determination may need to be collected at the crime scene to avoid loss during transport of the body. Approval shall be obtained from medical examiner personnel if available prior to collecting these items.

1. Lay the item(s) flat and allow to dry when possible
2. Photograph if applicable
3. Place the article between layers of paper
4. Roll or carefully fold and place in appropriate container

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## 22.0 Vehicle Processing

Vehicles may be utilized in the commission of a crime and need to be processed for forensic evidence. The processing of a vehicle may occur at the crime scene or at another location such as a forensic lab, a tow yard, or police department garage. The techniques involved with processing a vehicle vary only slightly from that of a “typical” crime scene which has been previously detailed in this manual.

The type of case, nature of the scenario and other investigative information can help the CSRT evaluate the vehicle and develop a specific plan for documenting, processing and collecting forensically relevant evidence.

When processing a vehicle, all applicable crime scene procedures shall be followed.

### 22.1 Vehicle Documentation and Photography

In some cases, positioning of seats, windows, and other moveable objects may be important and should be documented and photographed before they are altered. Areas of damage on the vehicle are also important to document and photograph. Additional documentation specific to vehicles may be necessary and is detailed on FS-37v worksheet located on the FSD Forms Page.

In addition to typical crime scene photography, additional vehicle photographs should also include:

- Vehicle identification number
- License plate number
- Registration tag information

### 22.2 Vehicle Evidence Search and Collection

Vehicle searches are conducted similarly to those for crime scenes detailed in Section 9.0 of this manual.

### 22.3 Known Tire Impressions

Known tire impressions may need to be collected from vehicles for comparison to questioned impressions from the crime scene or victim. There are multiple techniques that can be utilized to collect known tire impressions. Currently available techniques are detailed in the following procedures, but it is up to the analyst’s discretion on which method(s) is chosen.

Not every situation requires known impression from all four tires. It is the analyst’s discretion to determine which tires to collect known impressions from, but at a minimum, all four tires should be documented and photographed.

At least two people are usually be needed to successfully take the known impressions.

#### 22.3.1 Preparation and Documentation

Known tire impressions should record the full and continuous circumference of a tire and be created with the tire mounted on a vehicle (preferably the vehicle in question or a comparable vehicle). The ground where the known impressions are taken should be flat and smooth so that all surfaces of the tire make contact and leave an impression behind on the substrate.

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1. Remove excess dirt carefully from the tire surface
2. Record pertinent sidewall information from the tire in the notes and photograph the tire
3. Draw lines on the sidewall of the tire to indicate wear bars
4. Number or give some type of designator on the sidewall for each section between the wear bars
5. Label each tire appropriately with a designator that indicates its position of the vehicle so it is identifiable after it has been removed from the vehicle (e.g., LF = left front or DR FR = driver front, etc.)

### 22.3.2 Creating Known Impressions

When creating known impressions, mark the substrate (clear film or chart board) with relevant information for each tire.

- Location of tire on vehicle (e.g., front driver side, front passenger side, etc.)
- Direction of travel of tire
- Inside and outside of tire
- Position of wear bars
- Number/Designator for segments between wear bars

#### 22.3.2.1 Petroleum Jelly Method

This method utilizes a very thin coating of petroleum jelly, silicone or other appropriate substance on the tread surface of the tire that deposits a residue on a substrate when the tire is rolled over it. The surface is then processed with black fingerprint powder and made permanent with the application of clear spray paint to fix it to the substrate.

##### 22.3.2.1.1 Clear Film Substrate

1. Prepare a piece of chart board of sufficient length for the slightly more than the tire circumference
2. Cut a similar length of clear film and carefully tape it down the center of the chart board
3. Apply a **very thin** film of petroleum jelly (or similar substance) to the entire tread surface and circumference of the tire
  - a. The portion of the tire in contact with the ground has to be coated once the vehicle starts to move
4. Roll the vehicle (recommended method is pushing), so the tire makes a full revolution over the clear film on the chart board backer
  - a. While it is in motion, mark the areas where the wear bars are located on the clear film and label each of these section on the film between the wear bars with the corresponding designator from the sidewall of the tire
5. Develop the impression on the clear film with fingerprint powder
6. Remove excess powder from the film
7. Spray the entire surface of the clear film supporting the developed known impression with multiple layers of clear spray paint to fix it to the surface
8. Once dried, the film can be rolled up and packaged

##### 22.3.2.1.2 White Chart Board Substrate

Repeat the procedure above in 22.3.2.1.1 but do not use clear film. The impression is created on the chart board.

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### **22.3.3 Known 3D Impressions**

When questioned impressions from the crime scene are three dimensional, it may be necessary to create 3D known impressions. This can be done utilizing a similar technique to the above (without the need for chart board, clear film, ink, and petroleum jelly) with an appropriate media that creates an accurate 3D impression (e.g., BIO-FOAM®, Bubber®, clay, etc.). Permanent known 3D impressions can then be created utilizing dental stone to cast the known 3D impression.

### **22.3.4 Partial Known Impressions**

In some situations, only small segments of a tire or tires may be needed. Any of the techniques above can be utilized to capture partial known impressions onto a variety of substrates (e.g., paper, clear film, chart board, etc.). Adhesive lifts such as Handiprints are another viable option that can be used for these types of known impressions. This technique can also be used to capture known impressions of the sidewall of the tire if necessary.

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## 23.0 Excavations

Excavations of bodies and/or evidence combine archaeological and criminal investigative methods and techniques. The process is unavoidably destructive, so care shall be taken to document spatial relationships of items found and search through debris as it is removed.

The excavation crime scene and process should be documented, diagrammed and photographed similarly to any crime scene.

The following MSP specialty units may be of assistance and should be consulted:

- Canine Team
- Aviation
- Missing Persons / Anthropology

*When the excavation is for human remains, the investigating agency should be directed to contact the Medical Examiner's (ME) Office to notify them in case personnel from the ME's office want to be present. This notification should be documented in the notes.*

### 23.1 Excavation Scene Search

The search for the burial site or location where remains are located should be conducted using an organized search technique appropriate for the size and nature of the location.

The following surface characteristics may assist the CSRT with locating the burial site:

- Soil compaction / settling creating a concave area
- Raised areas
- Soil of different color/texture than surrounding area
- Disturbed vegetation
- Void of vegetation
- Different sized vegetation
- Pioneer plants (e.g., faster growing weeds)
- Different plants than surrounding area

Once potential burial site(s) is located, the following steps assist with determining whether to proceed to an excavation.

- Search the surface for any evidence that may be present and disturbances of the surface that could confirm a burial has taken place
- Probe the soil for change in soil compaction for outline of original hole
- Mark the perimeter of the original hole

#### 23.1.1 Excavation Hazards

Many hazards are possible when excavating and personnel should take the necessary precautions to protect themselves and those around them.



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Some of the hazards include:

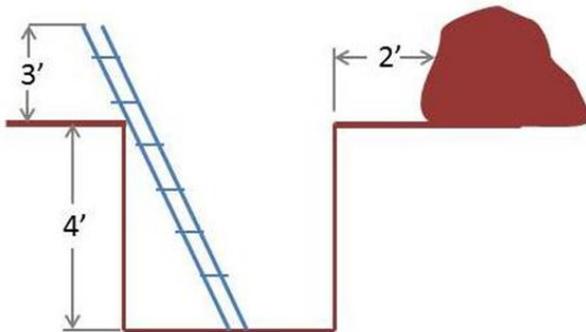
- Underground Utilities (both natural gas and electrical)
- Underground water pipes
- Buried hazardous material

*When an excavation is to occur in an area where it is possible there could be underground utilities, the investigating agency shall contact Miss Dig (<http://www.missdig.org/>) or the local utility companies to have the area scanned and marked prior to excavating.*

*When excavating and water is present (around and inside), additional precautions are necessary and the FSD Health and Safety Officer or another appropriately trained person shall be consulted.*

### 23.1.1.1 Cave-ins

*Excavations resulting in a hole **deeper than 4 feet**, require a ladder extending 3 feet above the ground level be present in the hole and the spoil pile (dirt being removed from the hole) to be 2 feet or further from the edge of the excavation.*



*Excavations of **5 to 20 feet** have the same requirements as those above for 4 feet, but the side walls shall be sloped or mechanically retained. For these types of situations, the investigating agency should contact their local department of public works or other properly trained personnel to consult and assist with the excavation.*



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Excavations **greater than 20 feet and those adjacent to a building foundation** require the assistance of specially trained personnel.

### 23.1.1.2 Falls into excavation

The excavation site should be well lit and personnel should use caution when moving around outside of the hole.

### 23.1.1.3 Equipment falling into excavation

Tools and other equipment should be positioned at least 2 feet away from the edge of the excavation. Any heavy equipment (e.g., backhoe, tractor, excavator, etc.) being used shall be positioned a safe distance away from the edge of the excavation to avoid falling in or collapsing the edge of the hole.

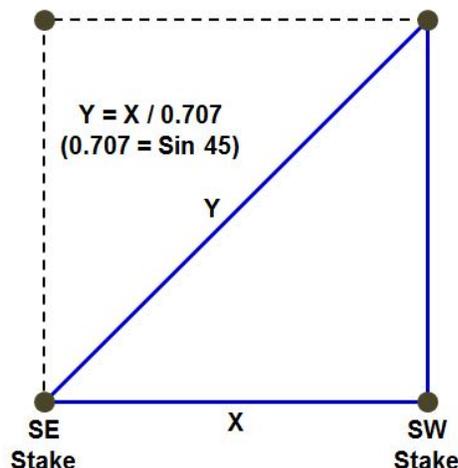
### 23.1.1.4 Injury by Heavy Equipment

When heavy equipment is involved with the excavation, CSRT personnel shall take additional precautions. High visibility vests and hard hats shall be worn and CSRT personnel shall not be in the hole while the heavy machinery is digging/working.

## 23.2 Excavation Process

### 23.2.1 Preparation of Excavation Area

1. Clear the area of large vegetation and other obstructions
2. Determine the appropriate sized area to excavate
3. Place the SW corner stake ("datum stake" to record measurements from)
4. Place the remaining three stakes to make a square area using right triangle rule (see figure below)



5. Connect the corner stakes with string to make a square perimeter
6. Shave off a thin layer of sod (if present) within the square perimeter

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### **23.2.2 Excavation**

1. Carefully excavate layer by layer (using appropriate technique - hand and/or large-tool) placing dirt into buckets
2. All dirt removed should be sifted onto tarps
3. As evidence and portions of the decedent are located, they should be measure (X, Y and Z)
4. Trowels, brushes and whisk brooms can be used around objects as they are located to pedestal them prior to collection

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## 24.0 Entomology Evidence

Insects on and around deceased persons can provide information about time of death, movement of the body, freezing or wrapping of the body, toxicological data and in some cases the DNA profile from the source they are feeding on. Therefore, when insects are observed at the crime scene, consideration should be given to collecting them as detailed below.

*The investigating agency should be made aware to attempt to deliver the live entomology evidence to a forensic entomologist within 24 hours of collection. After the samples are collected, the investigating agency is responsible for transportation and all fees associated with the forensic entomology analysis performed on the samples.*

### 24.1 Documentation and Photography of Entomology Evidence

The FS-37e worksheet located on the FSD Forms page should be used to record information specific to entomology evidence.

The location, number and types of entomological samples collected should also be recorded in detail and included on in the evidence table.

All entomological samples collected should be labeled with a minimum of the following information:

- Lab number
- Sample description
- Geographic location
- Location on body
- Date/time of collection
- Initials of person collecting

Labels on samples stored in alcohol should be written in pencil preferably with one label placed inside the container and one on the outside.

Photography of insects collected can be challenging but an attempt should be made to photograph representative insects prior to or after collection or after when possible.

### 24.2 Entomology Evidence Search

The majority of the insects can be found near, on and under the body. Some insects including blow fly pupae may migrate away from the body, so an area (up to 6 feet) around the body should also be searched if necessary. Blow fly larvae usually seek a dry and dark environment to progress to the pupae stage. Areas such as this should be searched for pupae (both pupae and pupae casings from which flies have already emerged).

### 24.3 Collection/Packaging of Entomology Evidence

All entomological samples should be stored out of direct sunlight and packaged to avoid breakage or leakage. Live samples should be stored in cool dry storage with a consistent recorded temperature whenever possible.

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## 24.3.1 Collection/Packaging Process

### 24.3.1.1 Adult flies and other flying insects

Adult flies and insects should be collected first because they are fast moving and can leave the scene rapidly once it has been disturbed.

1. Swing an insect net back and forth in the air over the body capturing as many flying insects as possible
2. Trap the flying insects in the end of the net by twisting and/or compressing an area slightly above the end
3. The closed portion of the net can then be placed in the mouth of the “killing jar” (glass container with cotton balls soaked in acetone or fingernail polish remover containing acetone)
4. Open the closed portion of the net to allow the flies to move into the jar
5. Cap the jar until all of the flies are immobilized
6. Transfer the flies to a vial containing the alcohol, label it and seal it

### 24.3.1.2 Beetles and non-flying adult insects

1. Pick up with gloved hand or forceps (collect as multiple insects of each type when possible)
2. Place in vial(s) containing alcohol
  - a. Similar types of insects can be stored in the same vial
  - b. Each type of insect should be stored in their own vial

### 24.3.1.3 “Maggot Motel” Construction

A live maggot rearing container should be created. There are many variations of this type of container that can be utilized. It should consist of a sample vial/cup of some sort with a screw cap with ventilation that does not allow the maggots or flies to escape. A layer (approximately at least 1 inch) of vermiculite, sterile sand or other appropriate dry substrate is placed in the bottom of the vial/cup. A foil pouch that contains the rearing food should be placed inside on the layer of dry substrate. Many of these types of containers can be constructed ahead of time and stored in the entomology kit.



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Live specimens should be transferred to entomologist within 24hrs for rearing. If that is not possible, the investigating agency or CSRT personnel should rear the specimens until they can be transported to an entomologist.

#### **24.3.1.4 Eggs**

1. Carefully collect approximately 50 to 100 eggs from egg masses
2. Approximately half should be retained as live samples and half as preserved samples
3. Live specimens can be placed in “maggot motel” or on moistened tissue paper in vials with ventilation (baby larvae are extremely small, so be sure ventilation holes are small)
4. If placing in “maggot motel”, carefully crimp the foil pouch allowing areas for the maggots to escape
5. Preserved specimens should be placed in vial containing alcohol and labeled appropriately

#### **24.3.1.5 Larvae from Maggot Mass**

1. Scoop with a spoon attempting to get a variety of sizes
2. Place approximately half into vial of alcohol
3. Place the remaining larvae onto rearing food in aluminum foil pouch in “maggot motel”
4. Place piece of wet paper towel over rearing food with maggots
5. Place dry pieces of paper towel on wet paper towel
6. Carefully crimp foil pouch allowing areas for maggots to escape
7. Seal both containers and label appropriately

If no Maggot masses are observed, attempt to collect at least 50 maggots from the body (variety of sizes if possible) and follow above directions for storage of live and preserved samples above.

#### **24.3.1.6 Pupae**

1. Attempt to collect at least 30
2. Place approximately half into vial of alcohol
3. Place the remaining pupae into “maggot motel” WITHOUT the foil pouch or rearing food
4. Seal both containers and label appropriately

#### **24.3.1.7 Hatched Pupae (hatched shell)**

1. Collect at least 20 and place in sample vial
2. Seal and label appropriately

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### 24.3.1.8 Soil Collection

Soil sample from under and around the body can be collected if deemed necessary. Approximately 4 inch cubes of soil should be collected from the following areas when necessary and packaged separately when possible.

- Under head
- Under torso
- Under arm(s)
- Under leg(s)
- 3 feet away
- 3 feet away in the opposite direction as above

*For questions or more information about Forensic Entomology contact the Department of Entomology at Michigan State University via their website (search Michigan State University Department of Entomology or utilize the contact info below).*

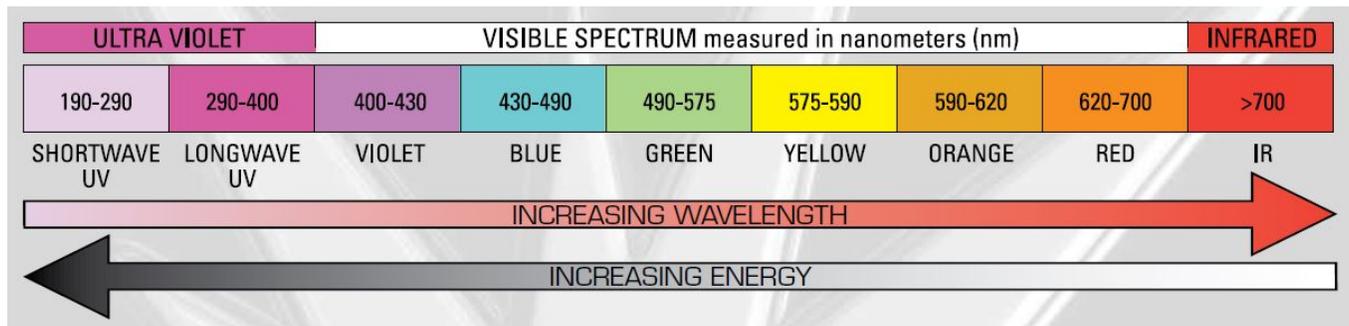
Michigan State University  
 Department of Entomology  
 Natural Science Building  
 288 Farm Lane, Room 243  
 East Lansing, MI 48824  
 Office: 517-355-8309  
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## 25.0 Alternate Light Source

Alternate light sources (ALS), sometimes referred to as forensic light sources, can be utilized at crime scenes to provide monochromatic light at specific wavelengths to aid in the visualization of evidence. The interaction of the light with the evidence can cause fluorescence/phosphorescence (evidence appears brighter than surrounding) or absorption (evidence appears darker than surrounding).

The spectrum of light below can be referenced to assist with the use of an ALS.



Typical evidence types that may be enhanced or detected with the use of an ALS include but are not limited to:

- Biological fluids (semen, saliva, urine)
- Fibers
- Blood
- Friction ridge impressions developed with fluorescent powders
- Footwear impressions
- Bones
- Bruises/bite marks/wounds
- Gunshot residue

Any fluorescence observed when using the ALS should be interpreted with caution since other non-biological substances may fluoresce (such as, but not limited to, suntan lotion, makeup, yogurt, detergents/cleaners, bleach alternatives, etc.). An ALS should be considered for use at most crime scenes especially those involving suspected criminal sexual conduct.

*Protective glasses/goggles shall be worn by all personnel in the vicinity when using an ALS at the crime scene. Do not look directly into the light source when it is turned on.*

*Extended exposure to UV light can degrade/destroy DNA, so use caution if searching with UV light.*

### 25.1 ALS Operation

The wavelength(s) and goggle combinations utilized along with any other operating parameters shall be documented in the case file.



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Refer to product user's manual or instructions for operation of the specific ALS being used. Be aware, some of these light sources require a warmup period and others can be used immediately after starting. Also, be prepared with equipment to mark, photograph and/or collect samples that are revealed with the ALS.

1. Remove as much ambient light as possible (best results are achieved in complete darkness)
2. Search areas by shining the light and slowly sweeping over the area
3. Areas of interest that are detected can be outlined or marked for further testing and/or collection
4. Items detected with the ALS (e.g., fibers, residues, powders, etc.) should be collected with the appropriate technique for the evidence type.

Items and areas of interest detected with the ALS should be documented in the notes and can be photographed when necessary using a filter over the lens of the camera.

The following table is a guide to assist with searches using the ALS.

<b>WAVELENGTH (nm)</b>	<b>ITEM/SUBSTANCE</b>	<b>GOGGLES</b>	<b>FILTER</b>
<b>UV</b>	<b>Bodily fluids; bruising/bite marks; fibers</b>	<b>Clear and/or Yellow</b>	<b>Clear and/or Yellow</b>
<b>Violet (400 – 430)</b>	<b>Bodily fluids; bruising/bite marks; hair; fibers</b>	<b>Yellow and/or Orange</b>	<b>Yellow and/or Orange</b>
<b>Blue (430 – 490)</b>	<b>Bodily fluids; bone/teeth/fingernails; GSR; hair; fibers</b>	<b>Orange</b>	<b>Orange</b>
<b>Green (490 – 575)</b>	<b>Bone/teeth/fingernails; fibers/ accelerants</b>	<b>Red</b>	<b>Red</b>
<b>Infrared (&gt;700)</b>	<b>Bloodstains; bloodspatter; fibers, GSR</b>	<b>Clear</b>	<b>Clear</b>

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## 26.0 Laser Measuring Device

A laser measuring device can replace or be used in conjunction with a traditional tape measure to record measurements at the crime scene. These devices typically capture measurements by the phase shift principle (measurement of the difference between the incoming and outgoing waves of light in the laser beam emitted by the laser measuring device).

These measurements are typically for documentation purposes only and need to produce a fair and accurate representation of the aspects being documented. Typical laser measuring devices are accurate to 1/16" which is sufficient for the accuracy necessary to capture general measurements of the crime scene and evidence locations. For situations where higher accuracy may be necessary or small distance measurements are needed, the laser measuring device may not be appropriate.

Refer to product user's manual or instructions for operation of the specific laser measuring device being used.

### 26.1 Performance Check

Prior to collecting measurements at a crime scene, the laser measuring device shall have a performance check run by measuring a known distance.

#### 26.1.1 Procedure

##### Option 1

1. Two rigid permanent surfaces on the CSRT vehicle that are a known distance apart should be marked with targets labeled to identify them as performance check points for the laser measurer along with the known distance
2. The laser measuring device is the used to measure the distance between these targets
  - a. A passing performance check is considered obtaining a result within 0.5in (12.7mm) of the known distance
  - b. If a passing performance check is not achieved in three (3) attempts, the laser measuring device shall not be used and taken out of service as described in the Equipment Section of this manual
3. The known distance and measured distance shall be recorded in the appropriate area of the FS-37

##### Option 2

1. Measure a known distance on a tape measure with the laser measuring device and record both distances in the appropriate area of the FS-37.
  - a. A passing performance check is considered obtaining a result within 0.5in (12.7mm) of the known distance
  - b. If a passing performance check is not achieved in three (3) attempts, the laser measuring device shall not be used and taken out of service as described in Section 1.2.6.1 of this manual

### 26.2 Collecting Measurements

Refer to product user's manual or instructions for operation of the specific laser measuring device being used. The following is generally how these devices are used to collect measurements.

1. Turn on the device (usually done with the single press of the on/off button)



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2. Confirm the device is set to measure distance
3. Confirm whether the device is measuring from the front surface or rear surface
4. Press the measure key (or similar button) to turn on the laser
5. The distance is then measured by holding the device level, aiming the laser beam at a target surface and pressing the measure key (or similar button) a second time
6. The measured distance then appears on the screen

Some devices are capable of additional measurements and calculations. To perform these, refer to the device's user's manual or operating instructions.

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## 27.0 Metal Detectors

Metal detectors may be helpful in the search for metallic evidence (weapons, projectiles, cartridges, cartridge cases, etc.) at the crime scene. A metal detector generally works by creating a magnetic field in the transmitter coil within the search coil. If the detector passes over a metal object, the magnetic field penetrates it and makes an electric current flow inside the metal object. This current flowing in the metal object creates another magnetic field which is detected by a receiver coil in the search coil and alerts the operator.

As a supplement for searching for fired evidence, MSP's Canine Unit should be considered.

Refer to product user's manual or instructions for operation of the specific metal detector being used.

### 27.2 Performance Check

Prior to searching with a metal detector at a crime scene, the metal detector shall have a performance check run by detecting known metal items. The results of this check shall be recorded in the case file. If using both the full-sized metal detector and the handheld, both shall be performance checked first.

#### 27.2.1 Performance Check Kit

Each laboratory shall have at a minimum the following items each in separate sealed transparent containers (e.g., heat sealed plastic bag) to be used during the performance check. These performance check items should be stored with the metal detector.

- Fired bullet
- Fired cartridge case
- Metal coin
- Aluminum or stainless-steel item

#### 27.2.2 Procedure

1. Distribute the performance check items in an area with a similar environment to that of where you are searching at the crime scene (if possible)
2. Swing the search coil of the metal detector over each item and confirm it alerts when over each item.
  - a. A passing performance check is achieved when the metal detector alerts for each performance check item
  - b. If a passing performance check is not achieved in three (3) attempts, the laser measuring device shall not be used and taken out of service as described in the Equipment Section of this manual
3. Document the results in the appropriate area of the FS-37

## 27.3 Searching with the Metal Detector

### 27.3.1 Full Sized Metal Detector

Metal detectors have different capabilities and settings depending on the make/model of detector. Consult the owner's/operator's manual for additional assistance.

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1. When assembling the metal detector tightly wrap the cord around the pole of the detector
2. Adjust the detector so that it fits properly and comfortably
3. Press the power button to turn the detector on and wait for it to be ready to search
4. Start with a low sensitivity setting and increase sensitivity as necessary (smaller or deeper objects will require higher sensitivity)
5. Swing the search coil back and forth in front of you in a straight line keeping the search coil approximately 1 to 2 inches above and parallel to the ground
6. When a target/item is detected, use the search coil to pinpoint the object
  - a. Pinpoint by moving the search coil short distances over the detected area right/left and then front/back
7. The area identified can then be visually searched or a handheld metal detector can be used

### **27.3.2 Handheld Metal Detector**

The Garrett Pro-Pointer AT metal detector can be used for search small areas/items and can be used in conjunction with the full-size metal detector.

1. Press and release the power button. Two beeps and the LED turning on indicates it is on.
2. To adjust the settings once it is powered on press and hold the power button for 2 seconds until a single beep followed by a dual-tone beep and flashing LED (in silent mode beeps are replaced by vibration pulses)
  - a. The first button press once in adjustment mode indicates the current setting
  - b. Repeatedly press the button to cycle through the 6 settings:
    - 1 beep = Minimum sensitivity - audio
    - 2 beeps = Medium sensitivity - audio (default setting)
    - 3 beeps = Maximum sensitivity - audio
    - 1 vibrate = Minimum sensitivity - silent
    - 2 vibrate = Medium sensitivity - silent
    - 3 vibrate = Maximum sensitivity - silent
  - c. To exit the adjustment mode, press and hold the power button for 2 seconds until a dual-tone beep sounds (or dual vibrate in silent mode)
3. First scan area with length of the metal detector parallel to the surface to locate the metal object
4. If necessary, the tip can be pointed toward an area to pinpoint the location of the metal object
5. To power off, press and hold the power button until you hear a single beep (or single vibration in silent mode)

### **27.4 Metal Detector Tips**

- Using the notch discrimination feature can help locate specific metal types and avoid “false positive” indications when other metals are present in the area
- Iron discrimination can also be set when it is believed that an iron audio signal may be masking another target signal

Special operation modes (e.g., notch discrimination, iron discrimination, custom settings) should be documented on the FS-37.

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## 28.0 Mass Fatality Incidents

### 28.1 Introduction

The following information and procedures are specific to mass fatality incidents and should be used in conjunction with the MSP FSD CSRT Procedures Manual in the event of a mass fatality incident response.

<b>ACRONYM GUIDE</b>	
CSRT	Crime Scene Response Team
DHS	Department of Homeland Security
EMHSD	Emergency Management and Homeland Security
ERT	Evidence Response Team
ESF	Emergency Support Function
ET	Evidence Technician
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FSD	Forensic Science Division
IC	Incident Commander
ICS	Incident Command System
MDARD	Michigan Department of Agriculture and Rural Development
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MDHS	Michigan Department of Human Services
MDOT	Michigan Department of Transportation
MDTMB	Michigan Department of Technology, Management and Budget
MEMP	Michigan Emergency Management Plan
MFI	Mass Fatality Incident
MI-MORT	Michigan Mortuary Response Team
MSP	Michigan State Police
OIC	Officer in Charge
WMD	Weapons of Mass Destruction

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A Mass Fatality Incident (MFI) is typically defined as an incident where the number of fatalities exceeds local and regional capabilities for body recovery, transportation, temporary storage, identification, examination, processing, family assistance, central collection sites and/or temporary interment.

In the event of a MFI, The Forensic Science Division (FSD) may be requested to respond. When a request for this type of incident is received it is usually part of the Incident Command System (ICS). ICS is a standardized approach to incident management that:

- Enables a coordinated response among various jurisdictions and agencies
- Establishes common process for planning and managing resources
- Allows for the integration of facility, equipment, personnel, procedures and communications operating within a common organizational structure

For additional information and explanations about ICS, please see the Mass Fatality Incident folder in the Crime Scene Response Team Discipline Specific Space on Qualtrax.

The Michigan Emergency Management Plan (MEMP) directs all state departments and agencies to follow the systems, assignments, protocols and procedures contained within it. The Michigan State Police Emergency Management and Homeland Security Division (MSP EMHSD) has developed and maintains an extensive set of support plans and procedures as well which may take precedent over the procedures within this manual.

### 28.1.1 Michigan Emergency Management Plan (MEMP)

The MEMP outlines eight Emergency Support Functions (ESF's). The two in **bold** include direction for FSD personnel.

1. Direction and Control
  - Lead department: MSP/EMHSD
2. Warning and Communications
  - Lead departments: MSP/EMHSD, MSP Operations, MDTMB
3. Information and Planning
  - Lead departments: MSP/EMHSD and Executive Office – Governor
4. **Health and Environmental Protection**
  - Lead departments: MDEQ, MDCH, MDARD
  - FSD direction (page 105):
    - **Assist in victim identification.** If an incident results in mass casualties, the MSP Forensic Science Division can assist the Michigan Department of Community Health (MDCH) in identifying victims, securing victims' personal effects, and in conjunction with the county medical examiner, establish a temporary morgue detail.
5. Human Services
  - Lead department: MDHS
6. **Resource Support**
  - Lead department: MDTMB
  - FSD direction (page 128):
    - The Forensic Science Division can provide laboratory analysis of substances or evidence through the MSP regional crime laboratories. The FSD can also provide support to the MDCH and local authorities in managing a mass fatality incident scene, establishing a temporary morgue, and securing and identifying victims in the aftermath of a mass fatality incident.
7. Public Works and Engineering

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- Lead department: MDOT
- 8. Public Safety
  - Lead department: MSP
  - **Federal law states that:**
    - ***The FBI will be the lead investigatory agency for terrorist attacks involving a WMD. In such incidents, the MSP will initiate and coordinate state and local criminal investigation of the attack, in cooperation with the FBI, DHS, and other involved investigatory agencies***

Another document/plan specific to Michigan that supports the MEMP for mass fatality incidents is the Mass Fatality Support Plan. Its intent is to enhance response effectiveness for mass fatality incidents in Michigan by outlining organizational structures, roles and responsibilities, coordination and communication channels, and other criteria specific to this particular component of an overall large-scale response. It follows the ICS system and can also be found on the Discipline – Crime Scene "Mass Fatality" page.

### 28.1.2 Official Order 004, Emergency Mobilization

*Michigan State Police Official Order 004, Emergency Mobilization (confidential) includes a section directing the enlisted member of the Forensic Science Division in the event of a mobilization.*

## 28.2 Mass Fatality Incidents (MSP Lead Agency)

The following procedures are intended for use by FSD CSRT at MFI crime scenes that require multiple teams from the lab or multiple teams from multiple labs.

### 28.2.1 Coordinating the CSRT for a MFI

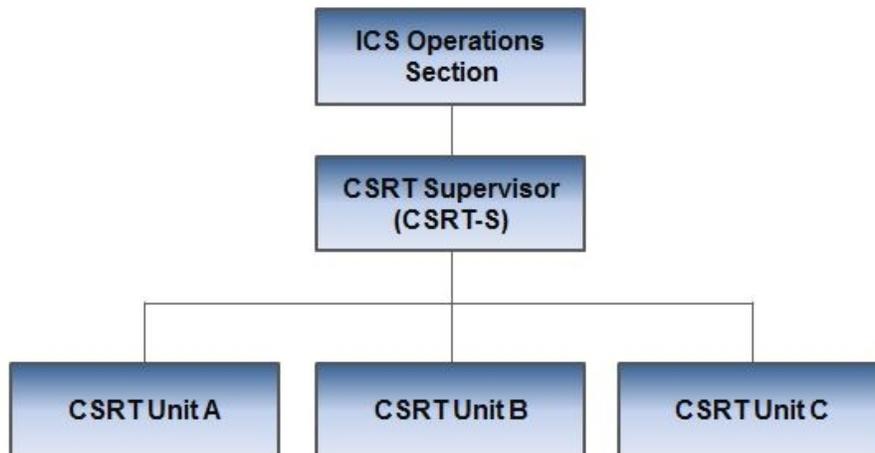
Crime scenes potentially falling into this category may be easily recognized upon receipt by the CSRT Coordinator or develop into a situation requiring additional lab's CSRT as the investigation proceeds. The CSRT Coordinator should collect appropriate information from the requestor to evaluate the number and expertise of the personnel necessary. Due to the fluid nature of these situations, it may be necessary to deploy additional CSRT personnel as it develops and/or after the initial CSRT arrive on-scene to assess it.

When it is deemed necessary that additional CSRT's and/or equipment is needed, the CSRT Coordinators of neighboring labs should be contacted (directly or through MSP Operations) to make the request. The number and expertise of the neighboring laboratory CSRT is dependent on the nature of the situation and availability of staff to respond. It is preferred to have at least one person from each of the typical CSRT disciplines (e.g., Biology, Firearms, Latent Prints, Trace Evidence) respond unless case details dictate otherwise.

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## 28.2.2 Command Structure and Team Assignments

The following command structure is provided as a general example but may have to expand or contract depending on the size and complexity of the incident. The goal is to have one person identified as the Supervisor of all of the CSRT Units and Leaders identified for each Unit. This results in a clear chain of command and ensure each individual is assigned only one supervisor. It is imperative that the supervisory structure allow for a manageable span of control (number of individuals or resources that one supervisor can manage effectively during an incident). Effective span of control on incidents may vary from three to seven, and a ratio of one supervisor to five subordinates is recommended.



### 28.2.2.1 CSRT Supervisor (CSRT-S)

The CSRT-S can be the most experienced crime scene analyst from the home lab (normally servicing the request area), a qualified member of the FSD key management team or another qualified CSRT member.

#### 28.2.2.1.1 CSRT-S Responsibilities

The responsibilities of the CSRT-S involved coordinating, overseeing and commanding all of the CSRT activity at the incident including but not limited to:

- Rotation of personnel for extended incidents
- Seeking out additional supplies/equipment
- Crime scene information passed up the chain of command
- Verbally and/or written briefing of incoming CSRT-S
- Assign FSD CSRT personnel to CSRT Units
- Designate CSRT Leaders for each CSRT unit
- Other command duties as they develop

The position of CSRT-S may change as the incident develops, as additional personnel respond and/or for prolonged incidents.

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### **28.2.2.2 CSRT Leader and Units**

CSRT personnel are assigned to a CSRT Unit by the CSRT-S and one of them designated as a CSRT Leader (CSRT-L) for each unit. The CSRT-L supervises the CSRT Unit and reports directly to the CSRT-S. Unit members assigned to this type of mass fatality incident report to their assigned CSRT-L for the duration of the response unless the command structure changes due to changes in the incident.

A CSRT Unit should consist of at least three personnel primarily assigned to documentation, photography and collection. These unit members are also responsible for processing/searching/collection of evidence within their area(s) of competence.

Each Unit should be assigned a letter and each member of the Unit a number (Unit A with team members A1, A2 and A3). The combination of the unit letter and member number shall not be reused and provides a way to identify that person for the duration of the response to include returning to the scene for multiple separate shifts.

### **28.2.2.3 Non MSP FSD Support Personnel**

MSP Evidence Technicians and/or federal/county/local crime scene personnel may also be available to assist. Crime scene personnel outside of MSP FSD that are assisting should be incorporated into Unit's with FSD personnel. The CSRT-L for these diversified teams shall be FSD CSRT personnel who are familiar with the MSP FSD CSRT procedures. MSP FSD CSRT procedures are to be adhered to during the processing of these situations when the MSP FSD has been requested to respond as the lead crime scene team.

### **28.2.3 Arrival**

A staging area should be designated for all CSRT personnel to meet unless this has already been done by the investigating agency. Upon arriving at the staging area, personnel should check in and receive their assignment.

A briefing shall be conducted once all personnel are present, so everyone has the same information and understands the nature of the case. This briefing should include the officer in charge (OIC) of the investigation, CSRT personnel, first responders (when possible) and any other relevant parties.

#### **28.2.3.1 Cross Contamination from Multiple Locations/Scenes**

If multiple scenes are to be processed, separate CSRT Units should be designated for each scene to avoid issues with cross contamination. Due to limited response vehicles and equipment/supplies this may be challenging. The CSRT-S and CSRT-L('s) for each has to use their knowledge and training to assess the situation and take necessary precautions to avoid the possibility of cross contaminating each crime scene.

#### **28.2.3.2 Evidence Labeling**

Evidence collected shall be uniquely identified, so that it can be individualized and related back to the crime scene. There are several ways this can be done. One simple technique that may be applicable is to use the unit letter of the unit collecting the evidence as a prefix to the evidence number (e.g. L-A1, L-A2, etc.). This may not work in all scenarios, but it is imperative to keep the evidence numbering system consistent for all units, individualized to each unit and organized in a fashion that simplifies associating it to the location/scene within the incident.

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### **28.2.3.3 Communication**

It is necessary for teams in different locations to communicate effectively. This can be done through department radios, cellular telephones or other appropriate communication devices available to team members.

### **28.2.3.4 Personnel Well-being and Shifts**

Each member of a Unit is responsible for and should take frequent short breaks, stay hydrated and eat. The CSRT-S shall help coordinate these breaks and with the investigating agency to obtain necessities for CSRT personnel. The Laboratory Director or other key FSD management personnel in the region of the crime scene(s) are encouraged to coordinate and be directly involved with providing necessities (food, drink, toiletries, supplies, etc.) to CSRT personnel unless this is already being done by the investigating agency or the ICS.

It is up to individual members of the CSRT to cease work and get sleep when necessary to avoid exhaustion and increased likelihood of mistakes. Personnel shall adhere to maximum work and awake limits identified within Section 2.0 of this manual.

### **28.2.3.5 Extended Responses and Rotation of New Teams**

For incident responses that extend beyond maximum limits, it is advised to attempt to stagger shifts to help with continuity and exchange of pertinent information. CSRT-L's are responsible for briefing CSRT-S in writing and/or orally, so incoming replacement teams are aware of what was done and what still needs to be accomplished.

## **28.3 Mass Fatality Incidents (MEMP Activated and/or Assisting Another Lead Agency)**

For large scale mass fatality incidents, the MEMP may be activated or another agency (e.g., FBI) may be the lead investigatory agency. In these situations, FSD CSRT's may be requested and assigned to a supporting role within the Operations Section of the ICS. When this occurs, FSD CSRT personnel follow the ICS chain of command and report to their assigned supervisor within the ICS for the duration of their involvement with the incident response. FSD CSRT personnel shall also follow procedures and protocols of the lead agency. If these are not provided, FSD CSRT personnel shall follow the procedures and protocols within Section 28.2 of this manual.

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### 29.2 Biology Evidence References

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### 29.4 Digital Evidence References

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### 29.5 Firearms Evidence References

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