

## Excerpted from Chapter 3 from **Crime Scene Investigation, A Guide for Law Enforcement** (2013)

### 3. Documentation

#### Sketching

##### *Equipment Needed*

- Graph paper
- Paper
- 50- to 100-foot retractable measuring tape
- 1000-foot walking wheel
- Folding rule
- Ruler
- Oversize clipboard with storage pocket
- Eraser
- Magnetic compass
- Personal protective equipment (when needed)
- Flashlight
- Notebook
- Pencil

The accuracy of all measuring devices should be ensured by comparison to a measure of certified accuracy, such as a NIST traceable ruler.

### ***General Considerations***

- A sketch of a crime scene is required when spatial relationships or proportional measurements are needed. Use spatial relationships to relate evidence to other objects. Use proportional measurements to calculate such things as bullet trajectory angles or to reconstruct accident details.
- The rough sketch is the first sketch drawn at the scene; multiple rough sketches may be required depending on the crime. The sketch includes a scene outline with the location of objects and evidence clearly marked. A finished sketch is derived from the rough sketch.
- Draw the rough sketch before anything is moved or destroyed, and after photographs are taken. Do not alter the scene.
- Depending on the crime, draw one or all of these types of sketches: a sketch showing the surrounding areas, a sketch showing only measurements, and a sketch showing locations of objects, such as the locations of evidence, victim(s), etc.
- Measurements should be accurate to within 1/4".
- Include, outside of the drawn crime scene, measurements for dimensions of rooms, furniture, doors and windows, and distances between objects, entrances and exits, bodies and persons. Draw details, such as object size, proportionally in a rough sketch.
- Take measurements from fixed location reference point, such as walls or curbs, or from stationary appliances.
- Include as much information as possible in the sketch: streets, plants, entry and exit points, location of bullets and cartridges, etc.
- Do not alter a rough sketch after leaving the crime scene. If changes are required of the rough sketch, photocopy the original rough sketch to preserve its integrity.
- Newer technology makes use of laser scanning devices to perform crime scene sketching. The employment of these devices should be reserved to investigators trained in their use.

### ***Information That Should be Documented***

- Record the time, date, name of the person who contacted the authorities, and incident information as soon as notification of a crime is received. These notes should be kept separate from the sketch.

- Initial notes about the incident should answer the who, what, when, where, why and how questions.
- Incident information includes: who reported the incident, when the incident was first reported, the crime scene location, a description of incident and participant names.
- Gather information to use when sketching by talking to others at the scene. Record that information in the notes.
- Questions that can provide valuable information include:
  - How did the victim or suspect arrive at or leave from the scene?
  - How was the crime committed?
  - Which items were handled?
  - Which items were moved?
  - Which items are broken or stained?
- Have potentially flammable vapors been detected at the scene? (When potentially flammable conditions exist, take appropriate precautions.)
- While sketching the scene, record related information in the notes. It is critical to use a systematic approach to note-taking while sketching to maintain a record of your activities and the order of sketches made.
- Specify the changes made to a scene prior to sketching, such as when objects were moved or placards added. Note who made the changes and why they occurred.

### ***Determining the Scale***

Determine the scale to use for all sketches. The usual scale for outdoor scenes is one inch equals twenty feet. The usual scale for indoor scenes is one-eighth inch equals one foot. Select which standard units of measurement will be used: metric (meters, centimeters) or English (feet, inches).

An important consideration when determining the scale is fitting the scene to the sketch paper. To calculate the scale:

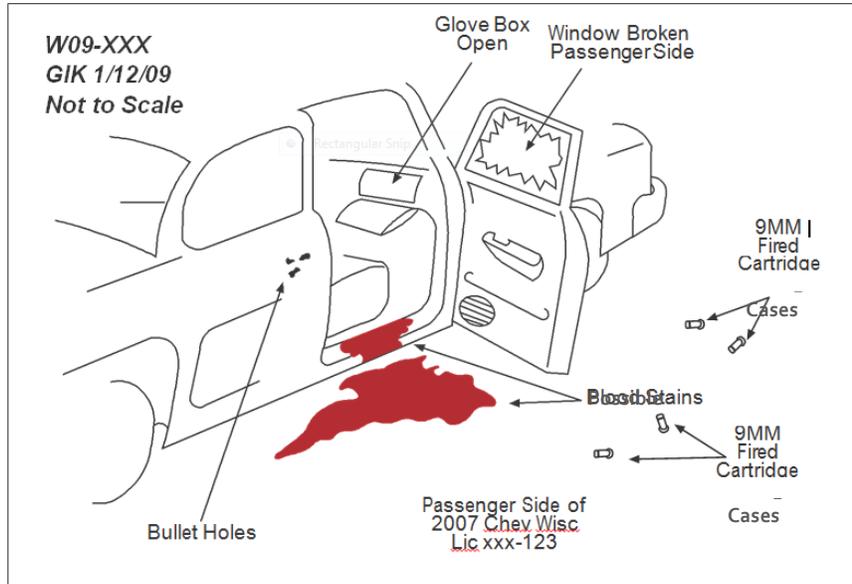
1. Determine the longest measurement at the scene.
2. Divide this measurement by the longest measurement of the sketch paper. The resulting number establishes the largest measurement end of the scale.

3. Often graph paper is used for scale drawings. When using graph paper, assign a specific number of squares to the measurement identified in Step 2.
- Use this method to establish other measurements by substituting the actual measurement in place of the longest measurement in Step 1.
  - Create a title block on the graph paper being used for the sketch in the lower right corner of the paper. The title block typically includes:
    - Case number
    - Crime type
    - Victim name
    - Name and ID# of sketcher
    - Name and ID# of person verifying measurements
    - Location of sketch
    - Date completed
  - Create a legend for the sketch on the graph paper used for the sketch. Each sketch must include a legend that is specific to it. A legend identifies:
    - North-facing direction (usually points to top of page)
    - Identification symbols used for information in sketch
    - Sketch ID#
    - Scale used
  - An accepted practice for assigning identification symbols is:
    - Use compass points to identify walls.
    - Use evidence numbers assigned to objects to identify them in the sketch.
  - The legend will be updated after drawing the sketch to ensure accuracy and completeness, and to include:
    - Measurements for dimensions of rooms, furniture, doors and windows
    - Distances between objects, entrances and exits, bodies and persons

### ***Categories of Sketches***

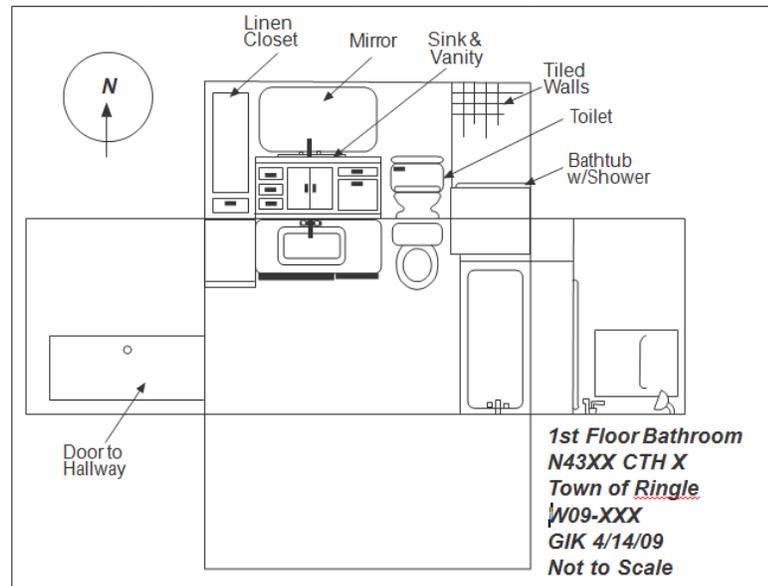
There are four categories of sketches:

**Perspective** – A perspective sketch contains a vanishing point and depicts objects of evidence as they would appear to the eye with reference to relative distance and depth.



*Figure C-1. Perspective sketch of vehicle homicide scene*

**Projection** – A projection sketch usually contains only one viewpoint and depicts objects on one plane. The overview sketch (of the horizontal plane) is the most common type of sketch and is usually done from a bird's eye view; it shows the floor plan. Less common is the elevation sketch (of the vertical plane), which shows a side view typically of landscapes or buildings.



*Figure C-2. Projection sketch of bathroom*

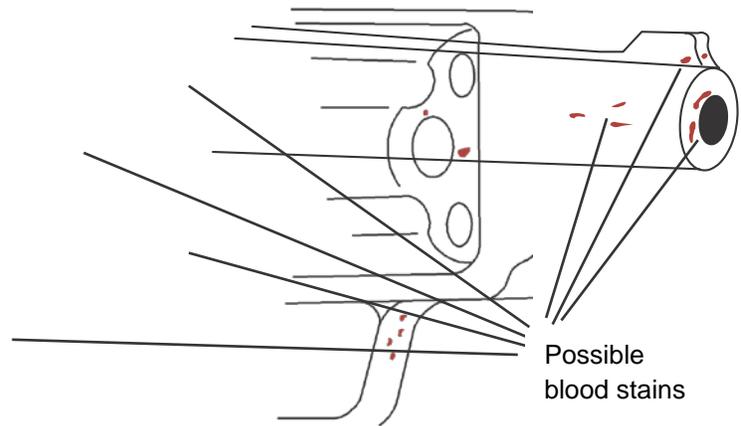
One extrapolation of the projection sketch is the “Exploded” view sketch that contains more than one wall from one viewpoint. It combines the overview and elevation sketches.

**Schematic** – The schematic sketch is used when it is desirable to represent a sequence of events such as following the trajectory of a bullet through a crime scene location.

**Detailed** – The detailed sketch is used when describing a small area that is not easily incorporated into the overall drawing due to the scale chosen for the rough or finished scale drawing. This is especially useful for large crime scenes.

### ***Creating a Projection Sketch***

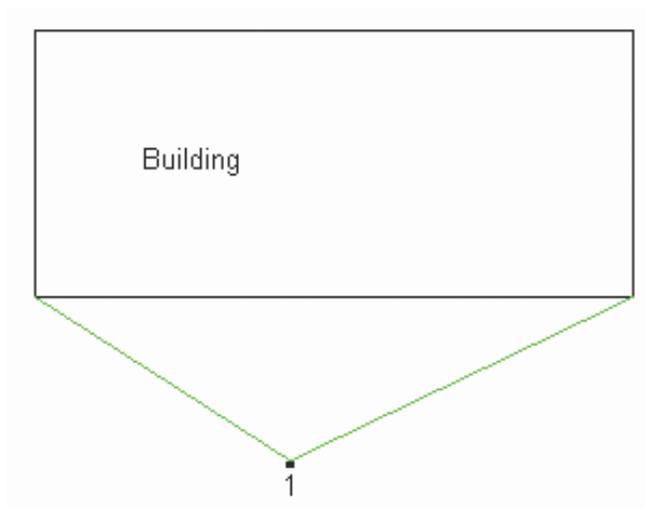
1. Determine the view to be shown in the sketch: overhead or exploded.
  - The overhead view shows a floor plan. This is the most frequently used view in sketches.
  - The exploded view shows a floor plan with walls laid out flat. Objects on the floor and on walls, such as bullet holes or bloodstains, are shown in their relative positions in the exploded view sketch.
2. Draw an outline that is to scale of the area of interest, including locations of approaches and accurate measurements of the perimeter. The size of the outline should fill as much of the paper as possible.
3. Draw the rough sketch before anything is moved or destroyed, and after photographs are taken. Do not alter the scene. Show locations of windows and doors. Use a curved line to indicate the direction that each door opens.
4. Use only the selected units of measurement. The sketch or accompanying notes should indicate where a measurement of an object was taken (e.g., middle of the object, near-corner, far-corner, etc.). Measurements of bloodstains are often done on a metric scale (e.g., millimeters).
5. Whenever possible, have another officer or crime scene investigator observe measurements for confirmation purposes.



*Figure C-3. Detailed sketch of handgun indicating areas of possible blood stains*

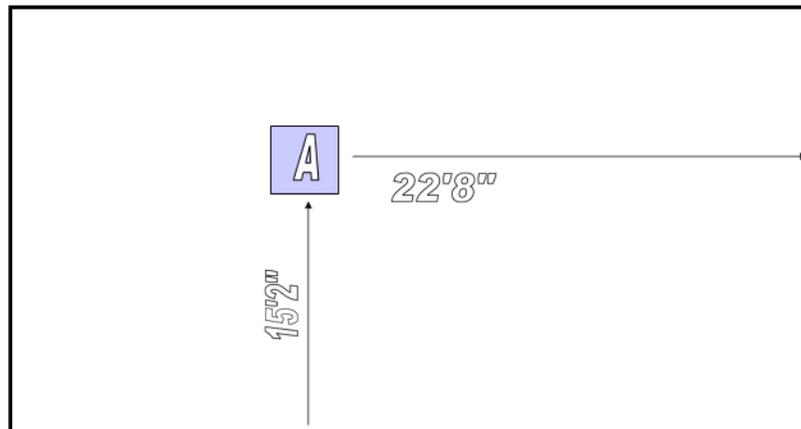
There are four measuring techniques used to obtain accurate measurements for the sketch:

**Triangulation Method** – The triangulation method utilizes two fixed permanent objects within the crime scene. Measurements are taken from each fixed point to each piece of evidence.



*Figure C-4. Triangulation method of measurement*

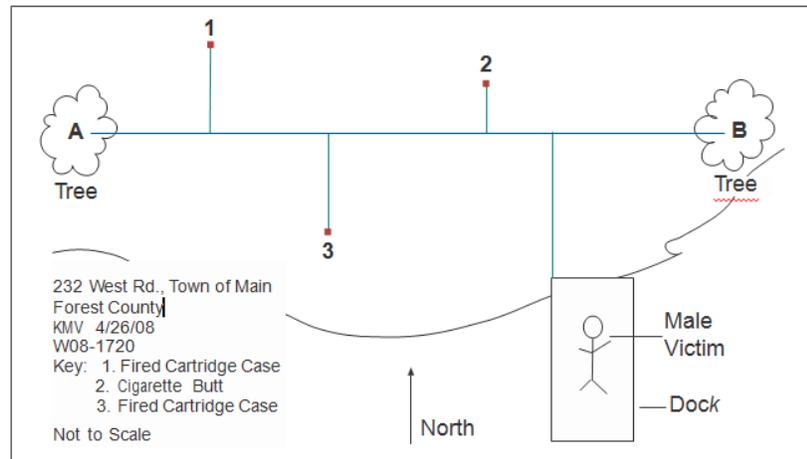
**Rectangular Coordinate Method** – The rectangular coordinate method is used when measuring the distance to an object from two mutually perpendicular objects, such as walls that meet at a 90-degree angle.



*Figure C-5. Rectangular coordinate method of measurement*

**Polar Coordinate Method** – The polar coordinate method is more appropriate for an outdoor scene in which only a single fixed or reference point is present. Measure both the distance and direction (angle) an object is from a known reference point. The angle can be measured with either a large protractor or an optical device such as a transit or a compass. The protractor technique with a 360-degree protractor is useful for underwater scenes.

**Transecting Baseline Coordinate Method** – The transecting baseline coordinate method is used to measure items of evidence when there are numerous objects in the crime scene and other measuring techniques will not work. This is accomplished by laying a tape measure down so that it crosses the entire room or area to be measured. This first tape measure becomes the baseline for all other measurements in the crime scene. Measurements are then made perpendicularly from this tape by laying another tape measure at a 90-degree angle to the first tape and measuring out to the evidence.



*Figure C-6. Transecting baseline coordinate method of measurement*

6. Take accurate measurements of the exact locations and relative positions of evidence using the triangulation method when there are at least two fixed points within the outlined area.
7. Use triangulation indoors or outdoors; it is an especially good method to use in areas lacking straight lines.
8. Take measurements from fixed locations, such as a wall or curb, or from a stationary appliance. Identify these locations in your legend.
9. Measurements should be accurate to within  $\frac{1}{4}$  inch.
10. Include height measurements to show how far off of the ground an object was found.
11. When determining distance based on triangulation:
  - a) Select two fixed points within the outlined area, such as walls, curbs, or street signs.
  - b) Draw a baseline between the two fixed points.
  - c) Select another object within the outlined area.
  - d) Measure the distance to that object from each of the baseline's fixed end points, creating a triangle.
12. Use a measuring tool to ensure accurate measurements are taken.
13. Take accurate measurements of the exact location and relative position of evidence using rectangular coordinates and the baseline method when: there are two known points or accurate measurements are needed for an object located

on or perpendicular to the line between those two points (the baseline).

14. Use the baseline method in outdoor areas that are irregularly shaped and where no natural baseline is present. This method is useful in situations such as scenes that occur in the desert or on farmland.
15. Take measurements from fixed locations, such as a lamp post or curb, or from a stationary appliance.
16. Measurements should be accurate to within  $\frac{1}{4}$  inch.
17. Include height measurements to show how far off of the ground an object was found.
18. When determining distance based on the transecting baseline coordinate method:
  - a) Select two fixed points within (at the outer edges of) the outlined area, such as a kitchen appliance, a door, a window, a corner or wall (a wall is preferred).
  - b) Create the baseline by drawing a line between the two selected fixed points.
  - c) Measure the length of the baseline.
  - d) Select an object within the outlined area.
  - e) When the object is on the baseline, measure from one of the fixed end-points to the object.
  - f) When the object is not on the baseline, draw a straight line from the object at a 90-degree angle to the baseline.
  - g) Measure the length of the line drawn.
  - h) Measure from one of the fixed end-points to the point where the new line meets the baseline.
19. When a sketch is complete, prominently write “Not to Scale” outside of the sketch, then update related documentation, such as the legend and notes. Note: Although accurate measurements were taken, potential courtroom controversies related to those measurements may be avoided by placing the “Not to Scale” disclaimer on the rough sketch.
20. Ensure that all identification symbols used on the sketch are included and defined on the legend.
21. Include descriptive details related to the sketch in notes such as lighting conditions, names of people in the area, colors of objects, odors, weather.

22. Include updates such as distances between objects and dimensions of rooms, windows, doors, etc.
23. Until all rough sketches for a crime scene are complete, repeat the previous steps.
24. Do not update any rough sketch after leaving the scene.
25. Finish note-taking at the scene. Include the time that sketching was completed in the notes. Note-taking should occur throughout the sketching activities.
26. Finished sketches can be completed either by the originator of the rough sketches or by another staff member, such as a draftsman or artist.

Excerpted from Chapter 3 from **Crime Scene Investigation, A Guide for Law Enforcement** (2013)

Find the entire **Guide** at [shop.nfstc.org/crime-scene-investigation-guide/](http://shop.nfstc.org/crime-scene-investigation-guide/)