Scene Sketching & Diagramming

for the Incident Scene Investigator

Presented by: Imprimus Forensic Services, LLC
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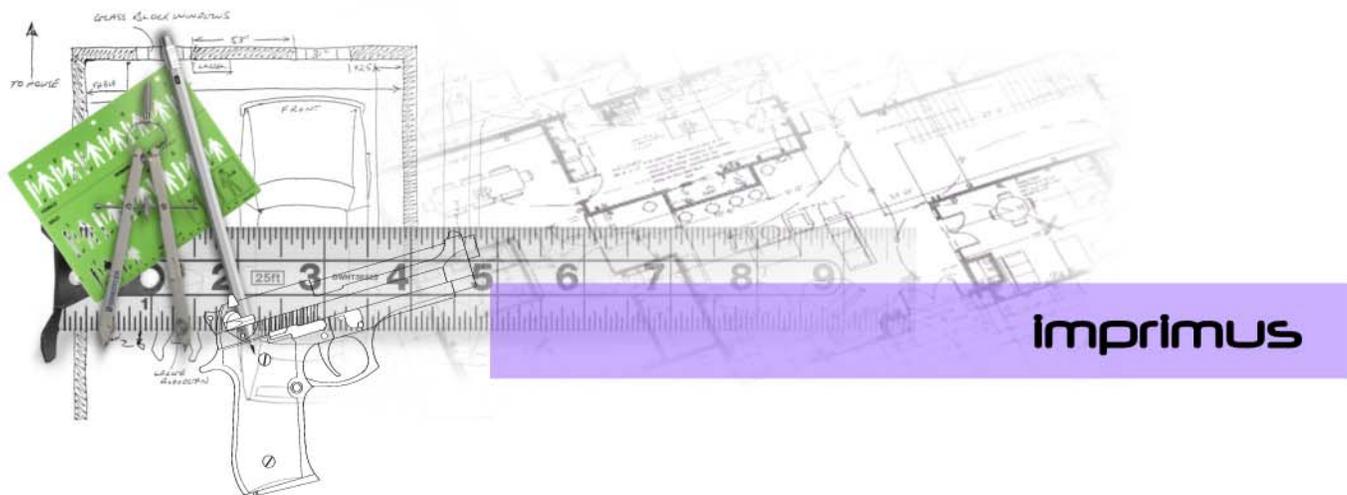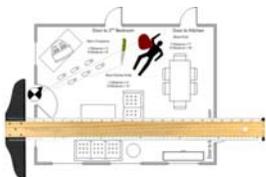
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Scene Diagramming – Purpose & Needs

Diagrams and sketches play a vital role in completing the proper documentation of crime and accident scenes. While diagrams are most commonly thought of as a form of supplemental information to the primary report, in reality they are an necessary complement to photographs.

Properly drawn diagrams are the only method available to correctly document the spatial relationships that exist in a crime or accident scene. These relationships occur between items of evidence and fixed or moveable objects within the scene. For both reporting and courtroom purposes, diagrams communicate information to others in a manner that would be near to impossible to do with words.

Unlike photographs or video tape, a diagram can be drawn to selectively include only the necessary and relevant items within a scene. Confusing detail can be eliminated. In this manner, the scene is presented in its most basic form.

As with other aspects of the reporting process, scene diagrams will serve to:

- Illustrate and accurately depict the scene
- Support photographic documentation
- Prove or disprove actions at the scene
- Explain how the evidence relates to the scene
- Refresh the memory of witnesses and investigators
- Support or refute statements by witnesses and suspects
- Help present evidence at trial
- Assist in event reconstruction
- Provide the basis for 3-D models

There are many types of diagrams that may be utilized by the crime scene investigator during the scene processing effort. Some may be simple thumbnail sketches like those found on the back of a fingerprint card. Other diagrams may be computer generated or professionally prepared. However they are done, the crime scene investigator should make extensive use of diagrams. Great artistic talent on the part of the investigator is not required. The most crucial aspect in preparing a diagram is that the information be properly collected and accurately represented.

Specific benefits of diagrams include:

- Better overall depiction of the scene
- Best depiction and permanent record of spatial relationships
- Simplification of the scene – Confusing details left out
- Combines benefits of field notes and photography
- Can record some conditions better than any other means
- Forces the investigator to look closely at the scene.

The methods presented here are those most commonly used by crime scene investigators. They are not necessarily the only methods that can be employed. Any technique that allows for the proper collection and representation of this type of information can be used.

3 Levels of Diagrams

1- Reference Sketches

> These are simple sketches that document the condition or location of evidence items. Examples include sketches on fingerprint cards, field sketches of footwear patterns and diagrams marking the locations of bloodstains.

2 – Scene Documentation

> These are more detailed diagrams that document a broader area and the relationships of evidence items within the scene. These sketches will show the location of evidence, the path or movement taken by the offender or victim, single or multiple rooms within a building and large indoor or outdoor areas.

3 – Scene Reconstruction

> These highly detailed diagrams are drawn to scale and are typically used to prove or disprove certain events.

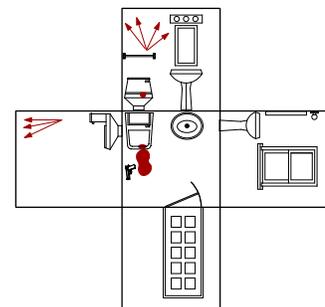## Terminology & Examples

Plan: An overhead view of a horizontal surface.
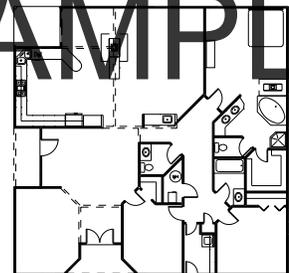
Elevation: A two-dimensional view of a vertical surface.

Cross Projection Sketch: A sketch of an interior space where the ceiling and walls have been unfolded.

Needs Assessment

The first step in completing a scene diagram or sketch, is to determine how the diagram will be used. Relatively minor incidents may require nothing more than a simple drawing done neatly at the scene. Major case investigations or reconstructions will require more detailed diagrams. The investigator should evaluate the following:

1. Evaluate the Scene

   - Nature of the crime
   - Indoor v. outdoor
   - Size / Furthest item of evidence (urban v. rural)
   - Availability of landmarks & reference points

2. How large is the area that must be documented?

   - One Room
   - Entire House
   - Entire Neighborhood

3. Determine Diagramming Requirements

   - Field or Reference Sketch
   - Finished Diagram
   - Scale Diagram
   - Level of Detail
   - Scene Reconstruction
   - Two or Three Dimensional Diagram
   - Three Dimensional Scale Model
   - Computer Animation

4. How will the final diagram be produced?

   - Hand Drawn
   - Computer Generated
   - Sent to Third Party

5. What unit of measurement will be appropriate?

   - Inches
   - Feet / Inches (Architectural)
   - Feet / Tenths (Engineering]

6. What measuring method would be best for the scene in question?

   - Baseline
   - Rectangular Coordinate
   - Triangulation
   - Polar Coordinate
   - Other (GPS Mapping)
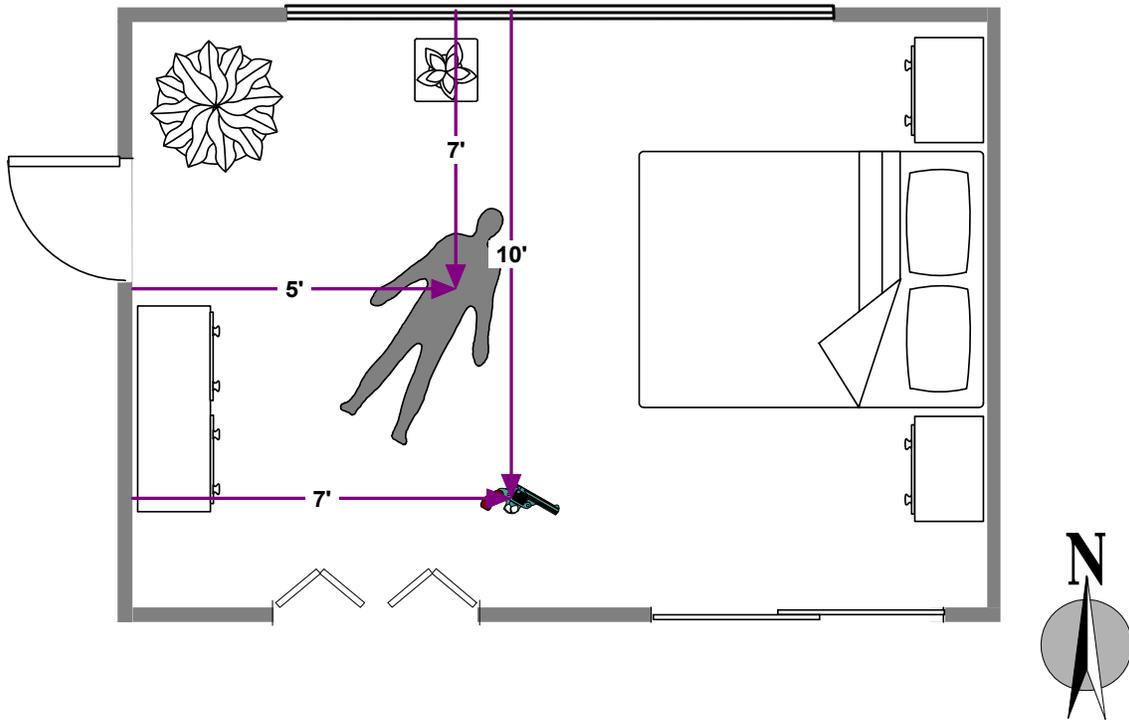
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In addition to measurements on a horizontal plane, the coordinate method is also well suited for locating objects along a vertical plane.
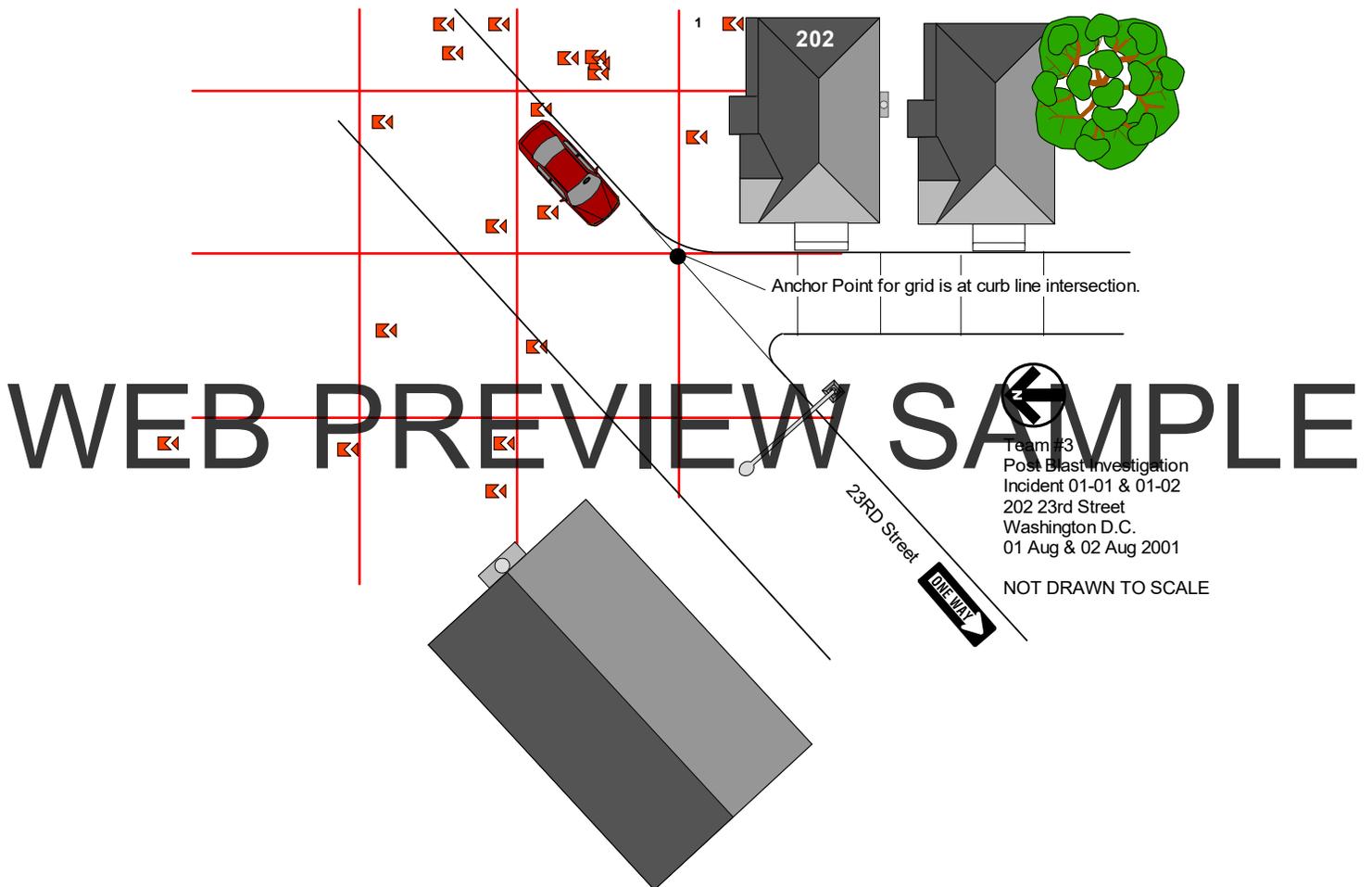
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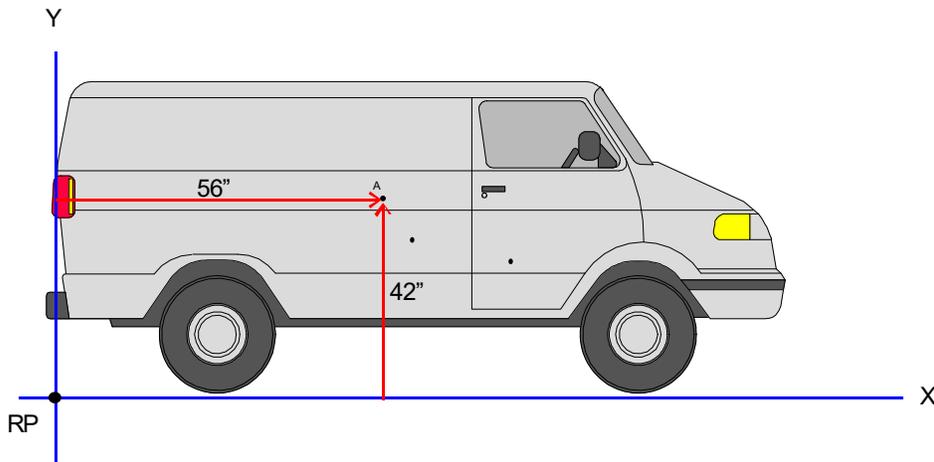
Outdoor Coordinate Grid

While the Baseline method is typically best suited for outdoor scenes, very large areas that need to be searched outdoors are also candidates for a coordinate system.
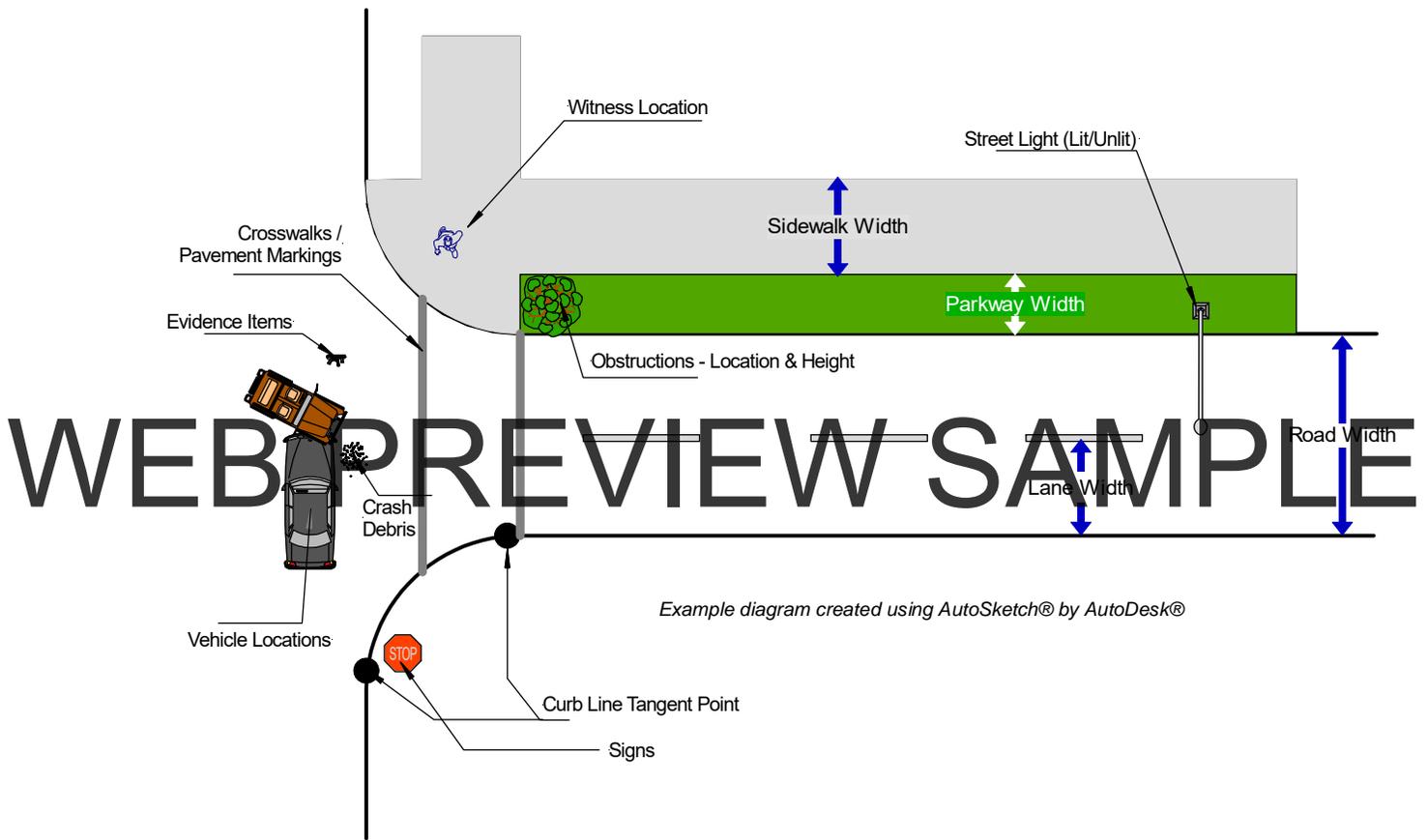
The scene of an explosion will most often require that a large area be searched to locate evidence. The crime scene will by necessity require that a search grid be established. This same grid can then be used for measuring and documenting the location of evidence.

The following example illustrates a search grid established for evidence collection after a car bomb detonation.

Anchor Point for grid is at curb line intersection.

Team #3
Post Blast Investigation
Incident 01-01 & 01-02
202 23rd Street
Washington D.C.
01 Aug & 02 Aug 2001

NOT DRAWN TO SCALE

23RD Street

202

ONE WAY

The grid is anchored at the intersection of the south curb line with the east sidewalk edge. Measurements can be taken within the grid itself, utilizing the anchor point as a point of origin (0, 0) mark, or they can be taken within a quadrant of the grid.

- Distance Between Utility Poles
- Height of Shrubbery
- Locations of Street Lighting
- Locations of Obstructions to View

Witness Location

Street Light (Lit/Unlit)

Sidewalk Width

Crosswalks / Pavement Markings

Parkway Width

Evidence Items

Obstructions - Location & Height

Road Width

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Lane Width

Crash Debris

Example diagram created using AutoSketch® by AutoDesk®

Vehicle Locations

Curb Line Tangent Point

STOP

Signs

Sketching & Diagrams

From rough sketches and proper measurements taken at a scene, effective diagrams and illustrations for court presentation can be prepared. These can be hand drawn or completed with the use of simple software programs.

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Rough field sketches with sufficient information to complete finished diagrams.

Three-Dimensional Views

Three-dimensional views of objects can be of two types, perspective or isometric.

Perspective View

To present something in the perspective view is to present it as it would appear to the human eye. The trademark of the perspective view is the vanishing point. Just as in real life, all lines in the drawing that are aligned along the same axis as the viewing angle, will converge and disappear into the horizon. This effect can be seen by sighting down a set of railroad tracks. As the parallel tracks move away from the viewer, they converge to a point at the horizon line. In addition to the tracks converging, the evenly spaced track ties grow closer and closer together.

This view can be an effective means to present information in a diagram and some software programs can present images in this manner. Hand drawing a diagram in this fashion is more difficult than other techniques, but it can be done.

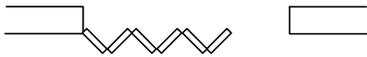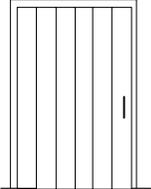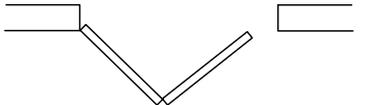Perspective image presented by 3-D Home Architect®

Isometric View

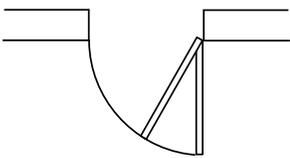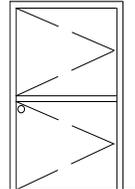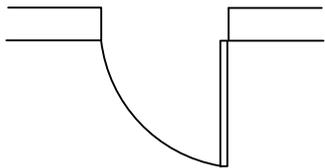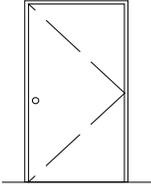The isometric view, like the perspective view, also presents all three axes of an image. The difference here is that there is no vanishing point. All parallel lines remain parallel and distances between objects and lines are viewed in their true spatial relationship. Many software programs can present 3-D images of an object in isometric view and hand drawing diagrams in this manner is easier that using a vanishing point.
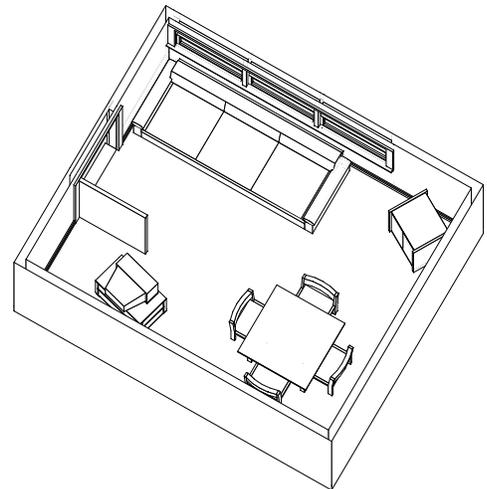
Isometric image presented by 3-D Home Architect®

The following are common symbols that are used in architectural and crash scene diagramming.

DESCRIPTION	PLAN	ELEVATION
Door – Interior – Accordion Fold		
Door – Interior – Bi-fold		
Door – Interior – Bi-fold - Double		
Door – Interior - Dutch		
Door – Interior - Hinged		
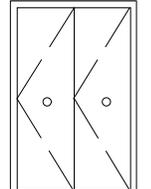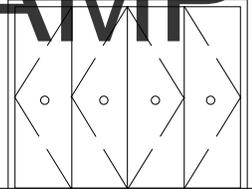
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