

DIAGRAMMING HAND OUT

Diagramming is as much art as science. There are certain principles which apply however, and many more will be gained from experience as you do your own diagrams. This hand out is designed to give you the basic skills needed to begin diagramming. It is not intended to present the way to do diagramming but rather a way. The margins have purposely been left wide to add you own notes.

Because most policemen who work special weapons teams are already skilled in interview techniques there will be no attempt to teach how to obtain a diagram from a suspect, witness, or victim. The emphasis will be on surveillance and photographs with bits and pieces of information used to "build" a profile of what the inside should look like. As stated in the lecture, no diagram should be taken as anything more than a likely floor plan.

To begin, you will need nothing more than your reference material, (photographs, notes, etc.), a sharp pencil and a good gum eraser. If you intend to be really neat, a pad of graph paper, ruler and compass are helpful. If you are working off photographs, a magnifying glass is recommended. After the rough sketch is completed you may want to do a "presentation copy" and color code it. This aids in forming a mental picture of the location since the information tends to become obscured when more and more detail is added. By color coding it, i.e. green trees and shrubs, brown driveways and streets, blue water, etc. the building information begins to stand out and aids you in briefing and planning.

1. PUT IN THE NORTH ARROW

Decide on how you are going to be looking at your sketch, then put in the north arrow. This will help you with positions and relationships when you begin looking at photographs from different locations and angles. This is particularly important when looking at aerial photographs.

2. SKETCH IN THE MAJOR TERRAIN FEATURES

Lightly sketch in the major terrain features such as streets, curb lines, driveways, etc. As you do this you will begin to get a mental idea of the scale. This will help you as you go along because it gives you a relational reference when you have to decide how big a tree is, how close is the side of a building to..., etc.

NOTE: Do not display anything which overlaps the building.
i.e. A tree which covers a roof, etc. This will be covered in step 6.

3. SKETCH IN THE OUTLINE OF THE BUILDING

Sketch in the outline of the building with reference to your major terrain features. Try to get it in roughly the same shape and size as our aerial photographs depict (if available) and in relation to your major terrain features.

4. SKETCH IN THE DOORS AND WINDOWS

As you draw the doors and windows, try and get the size relationships as close as you can. This will assist you later when you begin to put in your interior walls. Graphically, put in as much information about them as you can. i.e. which way the door opens, etc. Do not label anything yet as there is much detail to be added and you would inevitably have to move your labels later.

5. LIGHTLY SKETCH IN WHERE THE WALLS WOULD BE

To assist you in this, refer to the "HELPFUL HINTS" section at the end of this handout. This material has been gleaned from thousands of houses, (in southern California), as well as talking to building contractors. It is also important that you compare your anticipated floor plan (diagram) with the actual floor plan at the end of each operation. Practice greatly enhances the accuracy of predicting the floor plans on future operations and an honest critique will assist you in not repeating mistakes made in the past.

This information is perhaps the most difficult to obtain and consequently is the most apt to be continually updated. Because of this, lightly sketch in this information until you reach step 9. This will allow you to update the floor plan as more information becomes available without greatly hindering your efforts for a neat, complete diagram.

6. SKETCH IN THE TREES, SHRUBERY, AND OTHER PLANTS.

This will help you in determining places of concealment as well as obstructions. Many times large trees or peculiar plants are used to identify the individual building. Large trees are often used to orient another component of the team from the other side of the building as to the exact building; front doors or windows, etc. Also, if you are using any air support, the pilot/observer in the aircraft will be able to identify the location at greater distances if you can describe the landscaping. i. e. "The building with the two Italian Cypress trees at the 1-4 corner."

7. SKETCH IN FENCES AND VEHICLES WHERE THEY ARE USUALLY PARKED.

Fences should be described, i.e. "6 ft. chain link, 5 ft. cinder block wall," etc. Gates should be shown and, if possible, which way they open, just like the doors on the target location. The vehicles should be shown where they are likely to be parked at the anticipated time of the implementation of the operation. i.e. Vehicles may often be parked on the street but where are they at 0400 in the morning when you intend to hit the location? This will become particularly important to your containment team which confronts a gate which swings open toward a car parked in front of it.

8. SKETCH IN PERTINENT ADJACENT INFORMATION

This can not be over emphasized! Many times your approach to a target location is through adjacent property. Enough information needs to be given to adequately orient your containment personnel to guide them to their positions exactly! This becomes vital when your containment people have not seen the location or are moving at night. Remember also that many buildings look alike from the rear and there are no house numbers for identification.

You need to decide if evacuation is necessary and where and how it is to be accomplished. Note any doors or windows which face the target location. Do not give a lot of detailed information but do give sufficient detail to insure that your plan has considered the consequences of neighbors, look-outs, evacuation routes, etc.

In the urban environment, consider locating your containment personnel inside buildings where they are safer, easier to conceal, and able to exercise noise and light discipline much better than hunched down beside a bush near a window.

NOTE: Dogs are always considered pertinent information!

9. FINE TUNE YOUR SKETCH

Now is the time to carefully go over your sketch and insure that the information is accurate. Carefully and collectively (with your team) go over the floor plan. Darken the outside walls, excluding the windows. Leave blank spots for the doors with an arc to show which way you believe it swings, etc. Place labels and text accurately describe what is displayed. (refer to the graphic display chart at the end of this hand out for assistance.) If you can answer the following questions, you have a good start.

- (1). Is the building the right shape and oriented properly?
- (2). Are the doors and windows in approximately the right place?

- (3). Are driveways, gates, fences, sidewalks, trees, and shrubs clearly indicated?
- (4) Is the pertinent adjacent information thorough enough to avoid confusion?
 - (a). Are the vehicles and other mobile objects in the places they would normally occupy at the time of the service of the warrant?

10. PLACE YOUR COMPONENT TEAM POSITIONS ON THE DIAGRAM.

Now is the time to place where you want your team components placed. Indicate how they are to get there, i.e. Avenues of approach, etc. Indicate staging areas, evacuation routes, where "flash bangs" and/or other diversionary devices are to be placed, fields of fire/gun-target lines, landing zones, medi-vac routes, etc. A word of caution, do not lose your diagram in detail! If your diagram becomes cluttered you are defeating your purpose. It will only add to the confusion. If much detail is necessary, (i.e. complex operations, or operations with more than two phases) consider using a basic diagram (photo copy) with only the pertinent information on it for which it is intended. i.e. Avenues of approach and tactical considerations or evacuation routes, etc. In complex operations it may be necessary to photo copy the basic diagram and prepare a series of diagrams with only the necessary information for each topic to avoid confusion.

If suspect information is known or suspected, place this in the diagram. i.e. Night services usually have suspects in bedrooms, etc. This is the last step to diagramming. Remember though, diagramming is more of a process than an event! It should never be considered complete. If important new information becomes available, you should immediately revise your diagram and evaluate you plan in light of it.

DIAGRAMMING

Helpful Hints

There are certain "principles" which are applied to building designs which will aid you in determining floor plans from exterior information. For ease of understanding and application, these are presented in broad categories. Some information is necessarily overlapping into more than one category. A careful review will allow you to acquire the basic skills necessary to do a fairly accurate diagram.

The following information has been gleaned from scores of debriefings, previous diagrams, and interviews with building contractors and landscape designers. It should be reviewed and utilized as a "hint" only. The principles described are not universally adhered to nor have building techniques remained static through the years. New buildings are constructed different than old ones. Some "principles" in this handout may be unique to southern California and should be examined in light of different cultures or climates. Known differences are noted for reference.

ROOFS

1. Vents

Vents will assist you in identifying rooms, walls, etc. By being able to identify the vent you can often determine the purpose for the room and the location of adjacent rooms. For instance a stove vent is likely to be in the kitchen. Stoves are most often located against a wall. Thus by determining that this vent is a stove vent, you have determined the location of the kitchen as well as one of the interior walls. By knowing where the kitchen is, an adjacent room may be a dining room or area and so forth. By compiling several rooms, walls, etc. a "profile" can be formed which will indicate fairly successfully what the interior floor plan will look like.

a. Bathroom - 2" steel or PVC pipe, without cap, usually sticks up about 1 foot and has a sheet metal flashing sharply tapered on the high side of the roof and gradually tapered on the low side of the roof. On older houses it is usually galvanized, on newer houses it is usually painted the same color as the trim of the house or to blend with the roof color. The vent is for the toilet and is most often located on an exterior wall but may be anywhere on the roof. Plumbers usually try to align this vent with a toilet and if possible run other fixtures to it. Because of this the vent can be used for several fixtures at once

If this vent is on a multi-story house, look for another bathroom beneath it since it is quite common to utilize the same vent pipe for more than one toilet in two-story houses.

b. Stove Fan - 6" Sheet metal, often with an "umbrella" type hood over it, usually sticks up less than one foot. This vent can often be determined by grease which has collected dirt and discolored the vent. This vent often exits on an exterior wall under the eaves instead of the roof. On older houses it is usually galvanized sheet metal and on newer ones is painted to match the trim color or blend with the roof color. Stoves are most often located near a wall in the kitchen.

(1). This vent may also appear as a 5-6" cylinder with a similar size half cylinder laying at right angles on top of it as a rain shield. This type flashing is often used for other vents and if present should be viewed with other indicators before using it to locate the stove or kitchen.

c. Water Heater - 3 or 4" double wall, often sticks up 2 to 3 feet. This vent is most often located very near the kitchen. therefore, look for this vent near the stove fan vent. Most often galvanized on older houses and painted to blend with the roof color on newer ones. This vent often has a top which resembles an upside down "tomato can" to keep the rain out.

Water heaters are most often near the kitchen because of the continual need for instant hot water.

An older variation of this vent is often a clay pipe. This is usually of the same diameter and is difficult to distinguish from the double wall style unless the photographs are of extremely good quality.

d. Furnace - 5 - 6" double wall, often it may be a clay/masonry construction. Fire codes require this vent to stick up not less than two feet higher than any portion of the roof within ten feet. For this reason, it is most often the tallest of the vent pipes. Furnaces are often located near the center of the house because of the need for circulating the hot air but can also be found in a garage, basement or other non-living area because of the noise the fan makes when it is running. This vent is most often located over or nearly over the furnace and is used to expel hot exhaust as a result of combustion.

e. Air Conditioning - If air conditioning has been added after construction, particularly on commercial buildings with flat roofs, the vents are often placed on the roof with outlets in each room. This will indicate not only the number of rooms but where they are. It should also be noted that most air conditioning vents are located near the center of the rooms rather than the walls as opposed to heating vents which are located in the walls.

Helpful Hint: Because of the variety of vents available and difficulty in describing them, consider obtaining a sales brochure from your local lumber yard, contractor, or building supply center. These brochures are used by contractors for estimating and not only describe the vents but show pictures of them. Often, a brief description of what it is used for is included.

2. Chimneys

Chimneys in southern California most often indicate fireplaces. These are usually located in the living areas of the houses. In extremely large houses there may be a fireplace in the master bedroom. This can usually be determined with a high degree of accuracy using several methods together. i.e. windows, curtains, vents, etc.

* In a two story house the shape of the chimney may indicate more than one fireplace. If the taper from the fireplace to the chimney does not take place before the second story it is almost certainly supporting two fireplaces.

Another indicator is when looking at the top of the chimney and two flues are seen in the same chimney.

A fireplace on the second story is an extremely reliable indicator for either a master bedroom or family room.

Another type of chimney which is often seen is one made of stucco or other type of fascia. This type chimney is used for "zero tolerance" fireplaces. This fireplace needs no concrete footings and can be placed next to wood frame walls. It is the most common type of fireplace added during remodeling or renovation.

The tactical implications for this type of fireplace are identical for those of the masonry variety.

3. Roofing Material

A wide variety of roofing material is used in southern California and only limited inferences may be drawn from them. However, there is one extremely good indicator. If there are two or more colors or textures of roofing it usually means an addition has been added to the house since the original roofing was installed. Additions are harder to diagram than houses although the same principles apply regarding windows, curtains, vents, etc. Another good indicator is what part of the house was the addition attached? If the living area, it is most often a den or family room. If the sleeping area, it is most often a bedroom and/or bathroom. If it is determined that it is a patio, look for an exterior door under it.

4. Shape of Roof

The shape of the roof is another good indicator as to the layout of the house. This is particularly true of older houses. In older houses, rafters are used to support the roof. In the newer houses, trusses are often used. When rafters are used, a bearing wall running perpendicular to the rafters will be inside to allow the ceiling joists to rest on it. When this occurs it is most often one of the walls in a hallway or a series of bedrooms. These bedrooms usually exit on the common hallway.

In newer houses, (with trusses), the bearing walls for the roof are the exterior walls. Although, a bearing wall for the ceiling joists is still very likely to be running perpendicular to the trusses, near the middle of the building, the need to support the roof is not necessary.

One of the best indicators for where to locate a hallway in a building is the size of the building. As discussed previously, most bearing walls make up one side of a hallway or a series of bedrooms. Joists come in a variety of lengths but not commonly longer than 24 feet. Most lumber used for joists varies between 16 and 20 feet for ease of handling. If the building is wider than 24 feet, (measured in the direction of the rafters or trusses), quite likely a common hallway will be located near the center of the building.

WINDOWS

1. Bedroom Windows

Bedroom windows are often identified by more "elegant" curtains than other areas. i.e. shears, cafe or priscilla type curtains, often over venetian blinds. Other indicators are that they tend to be the second biggest windows of the house and are located near bathrooms which are the smallest windows of the house. Most often all the bedrooms are located near one end of the house and the living area at the other end. Thus by locating a bedroom, you will have an indication where the other bedrooms are, as well as the kitchen, and vice versa. One of the best indicators can be utilized during your surveillance because the lights in these rooms tend to be the first on in the morning and the last off at night.

2. Bathroom Windows

Bathroom windows are the most easily identified in the house. They are usually the smallest windows and are often translucent, (obscured), rather than transparent. Look for louvered windows, frosted glass and pull type shades. During surveillance look for steam on the windows from showers and baths. These windows are higher off the ground than any other window and shower and bath windows are likely to be right under the eaves. They are most often located near the bedrooms and can often be distinguished for this reason coupled with other characteristics.

3. Living Room

Living room windows tend to be the largest in the house. In older houses they face the street and in more modern houses they face into the back yard. These windows often have traverse drapes. This room may also be identified simply by examining the photograph with an illuminated magnifying glass or during surveillance with binoculars since the window is large enough to see into the room and identify furnishings. Also during surveillance the lights on this room often remain on the longest during the evening hours.

NOTE: When using drive-by photographs do not overlook the possibility of being able to see through these windows into the house. Their large size and proximity to the street often provide a good view of the interior, especially at night with the interior lights on. This can provide the next best information to actually being in the house.

4. Kitchen

Kitchen windows are medium size as a rule. They are usually about the same size or smaller than the bedroom windows. Look for windows under and near the water heater vent to identify this room. They also tend to be higher off the ground to clear the kitchen counters. A modern "fad" is the greenhouse window. This is a three dimensional window used for potted plants and is quite often an excellent indicator of the kitchen.

DOORS

1. Exterior Doors

Exterior doors may be identified easily by looking at the traffic areas. (see Landscaping) Sidewalks commonly indicate where the main entrance is. Exterior doors are solid and usually at least 1 3/4" thick. Residential exterior doors are at least 3 feet wide and swing into the building. If there is a screen door it will swing out. Exterior doors almost always enter the living area of the house and almost never the sleeping area.

a. ALL exterior doors on commercial buildings, buildings open to the public or where the public can be expected, swing out by law and must be equipped with panic type door latches. These are the large bar type door latches seen on the inside of department stores, etc. (Fire Code)

b. An important thing to remember about commercial buildings is the information which can be gleaned at a glance during surveillance or covert entries. Most Fire Codes require that a fire evacuation plan be posted near all the exits. i.e. escalators, elevators, stairways, and exit doors. This evacuation plan provides a complete floor plan of the floor you are on, and depicts the walls and exit doors as well as orienting you from where you are inside the building.

2. Interior Doors

The following is a guide for the location and direction of swing for interior doors of residential buildings:

a. All doors swing into the rooms and against walls.

b. Doors on a hallway swing away from the hallway and into the individual rooms.

- c. Closet doors swing out and towards you.
- d. Interior garage doors swing ^{into the garage} into the garage.
- e. Interior doors almost never swing into the center of a room, into a hallway, or closet.

Helpful Hints: If the door swings toward you, anticipate it to be the only entrance into the room and expect a small room or closet.

If the door opens away from you, expect a larger room with a closet or another room adjoining it and the major portion of the room to be located on the latch side of the door.

Interior doors are typically about 2'6" wide and exterior doors are typically 3'0" wide or larger. If inside a residential building you encounter a wide door that swings toward you, anticipate an exit.

Look for light switches inside the room on the latch side of the door. Most building and fire codes will not allow a door to be opened which will cover the light switches.

3. Sliding Glass Doors

Sliding glass doors usually exit one of two rooms in the house, a master bedroom or the den/family room. If the sliding door is on the second floor and enters onto a small balcony there is a strong likelihood that it is a master bedroom. Look for other indicators. Patios or additions often cover this type of door.

NOTE: This guide is almost universally followed by builders and city building codes and is an excellent indicator of wall locations if the doors can be seen and door openings if the wall locations can be determined.

LANDSCAPING

1. Sidewalks

In landscaping it is usually the sidewalks and driveways which stand out the most. This is especially true when using aerial photographs and is a great aid in identifying the location from the air and at great distances.

Sidewalks are good indicators of the main entrance which may be otherwise hidden by trees, awnings or patios.

2. Shrubs

Shrubs are utilized for diagramming because of the way they affect your avenues of approach and the suspect's avenues of escape. Cacti and other thorny plants as well as dense shrubs will definitely channel people around them. In some houses, which have utilized a professional landscaper this has been intentional. Thorny plants or dense shrubs are planted near windows to hinder entry. Although the original intention may have been burglary prevention it will definitely effect your planning for a SWT entry.

3. Dirt paths or worn areas in the lawn

Dirt paths and worn areas in the lawn are good indicators of heavy foot traffic. In many instances, rear doors invisible under eaves and awnings have been located simply by following the footpaths seen on aerial photographs. Equally important are footpaths which lead to other buildings on the premises. These are good indicators of persons who may be present but may not be in the house when the warrant is served. Footpaths may also lead to outside basement entries on older houses. If an exterior basement entry is located, look for a back door nearby.

4. Fences and block walls

There are a variety of fences and walls utilized for a wide range of reasons. The type of fence is often a good indicator for defensive preparations you may encounter on the inside of "fortified" locations since they indicate the level of commitment and preparation of the suspect. A wooden slat or picket fence will be viewed much differently than a chain link fence with concertina wire on top. A number of "rock houses" have utilized chain link fences in residential areas because they are harder to defeat than other types and still allow viewing through them, unlike block walls.

5. Gates

Gates may be sliding, swinging, even electronically controlled. Gates are often the most vulnerable part of a fence or wall and special attention should be paid on surveillance as to what are the locking devices, i.e. padlocks, keys, electronics, etc. Oft times a strong gate will have an exposed padlock which a small pair of bolt cutters can defeat, or if not, than a good push with a heavy truck. Equally important is which way the gate swings since this can be a good indicator as to how to defeat it. Gates are also indicators of traffic patterns.

a. Quite often, if the house has been intentionally fortified, look for video cameras or other types of anti-intrusion devices guarding gates.

MULTI-STORY HOUSES

1. Multi-story houses

Multi story houses present problems not encountered in single story houses because the upper floors shield diagramming clues. This does not mean that it is impossible to diagram the lower floor, however, because much information can be determined by noting some typical characteristics of two-story houses. These have been discussed elsewhere and only their application to diagramming two story houses will be noted here.

a. Living areas tend to be on the lower floors and sleeping areas tend to be on upper floors.

b. Sliding glass doors which open onto a small balcony on the upper floor is a good indicator of the master bedroom.

c. Bathrooms tend to be located over one another.

d. The same rules apply as to the size, shape, and location of windows and curtains. i.e. frosted windows tend to indicate bathrooms, sheer or priscilla type curtains tend to indicate bedrooms, etc.

e. Surveillance will often indicate which lights stay on the longest, come on and go off first. These indicators will be the same as for single story houses.

f. Stairways to the second story will tend to be in living areas rather than in sleeping areas and are often near the main entrance.

g. Look for closets between bedrooms since a closet is often utilized as a sound barrier between bedrooms. Consequently, when drawing interior bedroom walls, leave about three feet between the bedrooms for closets. This will help you keep things in scale.

* h. Fireplaces on the second floor usually indicate a family room or master bedroom.

i. Kitchens and eating areas are almost never located on the second floor.

j. With the popularity of cable T.V. being added another good indicator of a family room and/or bedroom is where the cable enters the house. For esthetic reasons it usually enters very near the television set it serves. Consequently look for a room where you might expect them.

ELECTRONIC ANTI-INTRUSION DEVICES

With the increased sophistication of high level drug suspects and the large amounts of money available for fortifying houses and other buildings, anti-intrusion devices have been encountered with increasing frequency and future encounters should always be considered as a possibility. As the demand for these devices has increased so has the supply and the cost has gone down. A fairly reliable system can now be purchased for less than five hundred dollars.

Anti-intrusion devices may utilize one or a number of configurations and because their primary purpose is to defeat intrusion they are particularly hard to overcome. Most alarm companies are run by law abiding people who will be glad to give you any information on the various systems and should be utilized when these devices are expected. For these reasons only the briefest guidelines are given here and should be augmented by expert information when anti-intrusion devices are suspected.

1. Door Alarms

Most door alarms are difficult to spot since they are quite often located above the door on the inside. Because the type of person likely to utilize anti-intrusion devices and the money and expertise it takes to install them, it is unlikely that these devices will be easy to spot. Further, these are often the most inexpensive types of anti-intrusions devices and if any device is suspected at all, this is the most likely type you may encounter.

2. Window Alarms

Look for metal tape or wires along the inside of the windows. Another device is simply a "vibration detector" designed to produce an audible alarm if the window is broken. This may simply be a small box, about the size of a pack of cigarettes and stuck to the window. These devices are a recent addition to the home burglar alarm market and can be found on doors also.

3. Video Cameras

Usually easy to spot, they are becoming increasingly more common. Look under eaves or awnings where the expensive camera can be sheltered from the elements. Although one of the easiest of the anti-intrusion devices to detect, they are not easy to spot if you are not looking for them. Also remember, if you can see "it," it can probably see you. This is especially true with wide angle lenses.

4. Ultra-sound Devices.

Ultra-sound is quite commonly a small hemisphere or sphere attached near a ceiling. Often of a metallic color, particularly silver, they are usually about 2 or 3 inches in diameter. These devices are almost always utilized inside and away from air conditioning and heating vents, motors, and relay switches, since they have a tendency to be set off with any movement or sound.

5. Infra-red Devices.

Infra-red devices utilize an "invisible" infra-red beam from a transmitter to a receiver. These devices are sensitive to being bumped and consequently are often located near concrete filled metal posts, near or on walls or other protected areas. Consider utilizing an infra-red "night scope" to locate these devices since they emit light in the same frequency spectrum as the infra-red viewing devices. The beams are invisible but the emitters (transmitters) will glow in the scopes.

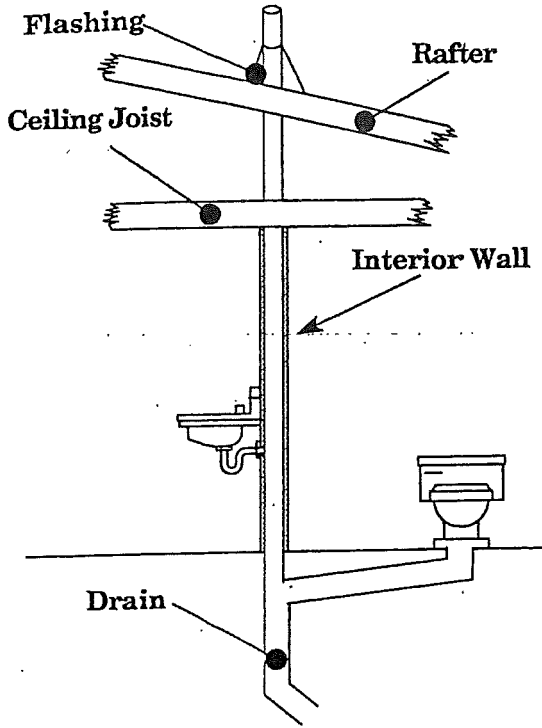
6. Seismic Intrusion Devices

These devices are vibration detectors planted in the ground on a perimeter and connected to an alarm inside. They are triggered by vibration and a trained operator can oft times detect the type of movement and direction of travel by monitoring the entire system. These devices are most vulnerable when "explained" vibration interrupts them. i.e. thunderstorms, heavy trucks or machinery, etc. These vibrations will cover other noises.

Helpful Hints: These types of anti-intrusion devices are difficult but not impossible to overcome. For diagramming purposes they will affect your avenues of approach much like fences or shrubs. But what can be designed by man can be defeated by man! Your imagination is your only limitation in overcoming these and for this reason it would be pointless to try and set guidelines for defeating these systems. Each is going to be unique. SEB has encountered a variety of these devices in actual situations and periodically trained on local businesses to practice defeating them. Some possibilities are power shortages, spraying paint on cameras, shooting cameras with suppressed weapons, diversions, etc.

A good rule on a sophisticated system is to look for another type of anti-intrusion device when a noticeable shortcoming of one type exists. i.e., A blind spot for a video camera may be an ideal spot for an infra-red beam. The level of sophistication should be an indicator as to other "defensive" preparations you may also encounter but one should never discount the tin can filled with pebbles and tied with string near a likely avenue of approach. It is embarrassing indeed to be fooled by this simple age-old trick and have the suspect flushing dope during entry.

Stack Vent



Water Appliance Vent

