CHAPTER 2

URBAN ANALYSIS

Combat in urban areas requires thorough knowledge of the terrain and detailed intelligence preparation of the battlefield (IPB). To succeed in urban areas, commanders and leaders must know the nature of both the terrain and of the enemy they may face. They must analyze the effect the urban area has on both threat and friendly forces. The focus of the material presented in this chapter will be on those issues of urban analysis that commanders and leaders must consider before beginning the detailed planning process. (For a detailed explanation of urban IPB, see FM 34-130).

Section I. MODELS OF URBAN AREAS

Each model of an urban area has distinctive characteristics, but most resemble the generalized model shown in Figure 2-1.

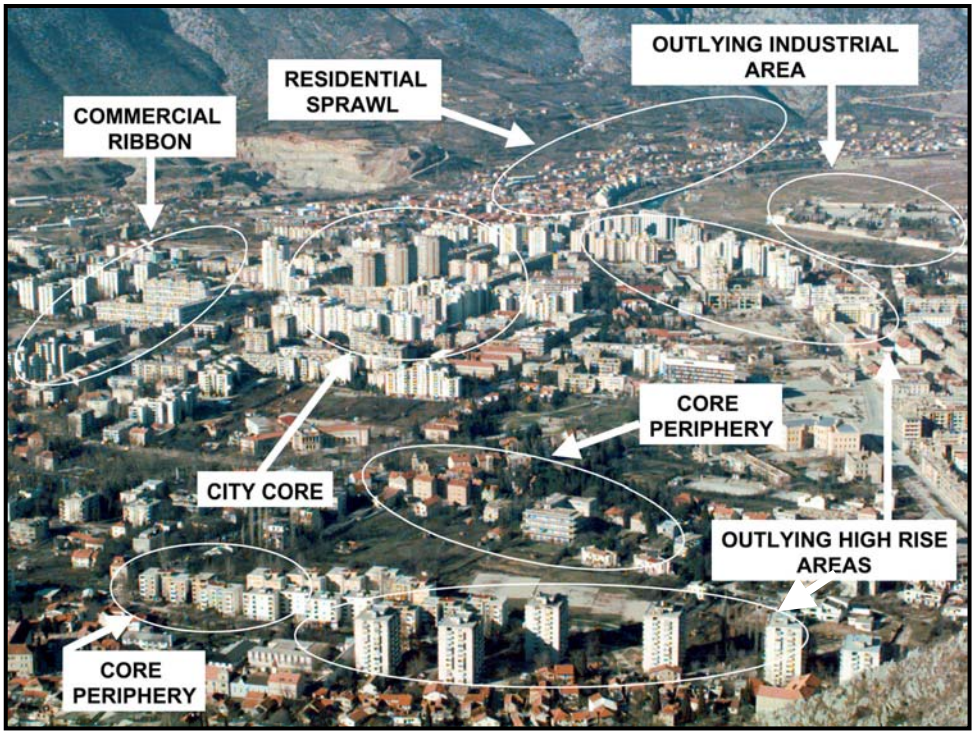


Figure 2-1. Generalized model of an urban area.

2-1. GENERAL URBAN CHARACTERISTICS

Although different in many important ways, urban areas all over the world share many characteristics such as density of construction and population, street patterns, compartmentalization, affluent and poor sections, modernization, and presence of

industrial and utility systems. Most differences in urban areas are in size, level of development, and construction style.

a. Most major world cities have European characteristics. They have combination street patterns, along with distinct economic and ethnic sections with differing construction techniques. Often, there are extensive shantytown or slum areas combining very high population density with flimsy, highly inflammable buildings. These type patterns present obstacles to vehicles.

b. Variations in cities are caused mainly by differences in economic development and cultural needs. Developed and developing countries differ more in degree and construction style rather than in structure and function. Major urban trends are: high-rise apartments, reinforced concrete construction, truck-related industrial storage, shopping centers, detached buildings, suburbs at outer edges, and apartment complexes.

c. The spatial expanse of cities throughout the world in the last three decades presents challenges for the execution of UO. The increased use of reinforced concrete framed construction is only one example of the trend to use lighter construction, which affects how forces attack or defend such an area. Also, concrete and steel high-rise structures hinder wall breaching and limit radio communications. Another example is the growing apartment complexes, shopping centers, and truck-related industrial storage that lie on the outskirts of towns and cities. This change in style causes offensive action to be more difficult and may enhance the defense of such an area.

2-2. DESCRIPTION OF URBAN AREAS WORLDWIDE

General descriptions of urban areas worldwide are discussed in this paragraph.

a. **Middle East and North Africa.** All nations in this region can be reached by sea. This region has long, hot, dry summers and mild winters, making life outside cities difficult. In spite of its vast deserts, greater urban congestion has resulted. Ancient cities have expanded into metropolises and many new cities have been created because of the petroleum industry (mainly in the Persian Gulf). European influence and petroleum revenues have resulted in urban centers with modern sections of multistory buildings surrounded by large areas of single-story, sometimes sturdy, but often flimsy, construction.

b. **Latin America.** Most urban centers can be reached by sea with many capitals serving as ports. This region has mainly a tropical climate. It has a strong Spanish influence characterized by broad avenues that radiate from a central plaza with a large church and town hall. Upper and middle class sections combine with the urban centers, while the lower class and poor sections are located at the outer edges of the city, often forming shantytowns.

c. **Far East.** Except for Mongolia, all nations in this region can be reached by sea. Urbanization is dense, especially in coastal cities where modern commercial centers are surrounded by vast industrial developments and residential districts.

d. **South Asia.** This region has great European influence with wide busy streets that are overcrowded. Urban centers may be composed mainly of poorer native sections with few or no public services and alleys no more than a yard wide.

e. **Southeast Asia.** This region also has strong European influences with most capitals and major cities serving as seaports. Urban centers contain both the older,

high-density native quarters with temples or religious shrines, and modern sections with boulevards, parks, and warehouses.

f. **Sub-Sahara Africa.** In contrast to other regions, this region cannot be accessed by sea and has impassable terrain. Except for a few kingdoms, towns did not exist before the arrival of the Europeans. As a result, urban areas are relatively modern and without "an old quarter," although many do have shantytowns.

g. **Polar/Arctic Regions.** Polar/arctic regions are extremely harsh environments where weather and rugged terrain can adversely affect military operations. Buildings tend to be more modern due to scientific study and exploration.

Section II. TERRAIN AND WEATHER ANALYSES

Terrain and weather analyses greatly affect the IPB. Specific discussion of terrain and weather analyses is contained in this section. (See Appendix G for more information.)

2-3. URBAN ZONES AND STREET PATTERNS

The urban area is analyzed using the zones and street patterns herein.

a. **Urban Zones.** The S2 subdivides the area of operation (AO) and the area of interest (AI) into appropriate types of *zones* as described below. (See FM 34-130 for more information.)

(1) ***City Core*** (Figure 2-2). The city core is the heart of the urban area—the downtown or central business district. It is relatively small and compact, but contains a larger percentage of the urban area's shops, offices, and public institutions. It normally contains the highest density of multistory buildings and subterranean areas. In most cities, the core has undergone more recent development than the core periphery. As a result, the two regions are often quite different. Typical city cores of today are made up of buildings that vary greatly in height.

Figure 2-2. City core.

(2) ***Core Periphery*** (Figure 2-3, page 2-4). The core periphery is located at the edges of the city core. The core periphery consists of streets 12 to 20 meters wide with continuous fronts of brick or concrete buildings. The building heights are fairly uniform—two or three stories in small towns, five to ten stories in large cities. Dense

random and close orderly block are two common construction patterns that can be found within the city core and core periphery zones.

Figure 2-3. Core periphery.

(a) *Dense Random Construction* (Figure 2-4). This construction is a typical old inner city pattern with narrow winding streets radiating from a central area in an irregular manner. Buildings are closely located and frequently close to the edge of a roadway.

Figure 2-4. Dense random construction.

(b) *Close Orderly Block Construction* (Figure 2-5). Wider streets generally form rectangular patterns in this area. Buildings frequently form a continuous front along the blocks. Inner-block courtyards are common.

Figure 2-5. Close orderly block construction.

(3) ***Dispersed Residential Area*** (Figure 2-6). This type area is normally contiguous to close-orderly block areas in Europe. The pattern consists of row houses or single-family dwellings with yards, gardens, trees, and fences. Street patterns are normally rectangular or curving.

Figure 2-6. Dispersed residential area.

(4) ***High-Rise Area*** (Figure 2-7). Typical of modern construction in larger cities and towns, this area consists of multistoried apartments, separated open areas, and single-story buildings. Wide streets are laid out in rectangular patterns. These areas are often contiguous to industrial or transportation areas or interspersed with close-orderly block areas.

Figure 2-7. High-rise area.

(5) ***Industrial-Transportation Area*** (Figure 2-8). Industrial-transportation areas are generally located on or along major rail and highway routes in urban complexes. Older complexes may be located within dense, random construction or close-orderly block areas. New construction normally consists of low, flat-roofed factory and warehouse buildings. High-rise areas providing worker housing is normally located adjacent to these areas throughout the Orient. Identification of transportation facilities within these areas is critical because these facilities, especially rail facilities, pose significant obstacles to military movement.

Figure 2-8. Industrial-transportation area.

(6) ***Permanent or Fixed Fortifications*** (Figure 2-9). These include any of several different types and may be considered isolated forts, such as the Hue Citadel and the German fortifications that surrounded Metz, or as part of a fortified line (Siegfried and Maginot Lines). While most of these fortifications are found in Western Europe, many can be found in the Balkans, Middle East, Asia, Africa, and South America. Those in the United States are mostly of the coast defense type. Permanent fortifications can be made of earth, wood, rock, brick, concrete, steel-reinforced concrete, or any combination of the above. Some of the latest variants are built underground and employ heavy tank or warship armor, major caliber and other weapons, internal communications, service facilities, and NBC overpressure systems.

Figure 2-9. Permanent or fixed fortifications.

(7) ***Shantytowns.*** Shantytowns do not necessarily follow any of the above patterns and may be found in many different zones within urban areas. Many underdeveloped countries are composed of small towns and villages and very few large cities. Most of the structures in the small towns and villages may be constructed from materials ranging from cardboard to concrete block. Some countries in arid regions depend on adobe for construction. Even the larger cities can have shantytowns at the edge that consist of cardboard or tin shacks (Figure 2-10, page 2-8).

(a) These less structurally sound buildings have no common floor pattern and are more likely to have only one room. These types of substandard structures present a problem of weapons over-penetration. Weapons fired in one structure may penetrate the walls of one or more buildings. This penetration becomes a hazard for friendly forces as well as noncombatants. In order for buildings not to be structurally damaged or completely destroyed, reduce the explosive charges or do not use them. Fires are also more likely to develop and spread in shantytowns.

(b) Depending upon the type of operation, the temporary nature of the structures can mean that mobility can be either more or less restricted than other sections of an urban area. A unit with armored vehicles may easily knock down and traverse structures without affecting mobility at all. However, their destruction may cause unacceptable civilian casualties, in which case mobility becomes more restrictive as the narrow paths often do not accommodate vehicles. Regardless, commanders must carefully consider the effects of their operations in this area, to include vehicles and weapons, as the weak structures afford little protection increasing the risk of fratricide, civilian casualties, and large, rapidly spreading fires.

Figure 2-10. Shantytown construction.

b. **Street Patterns**. Knowledge of street patterns and widths gives commanders and leaders a good idea of whether or not mounted mobility corridors in different zones can permit wheeled or tracked vehicles and facilitate command and control. For example, a rectangular, radial, radial ring, or combined pattern facilitates movement and control better than irregular patterns. Common street patterns within the AI and AO are described in Figure 2-11.

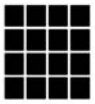
Shape	Street Pattern	Effect
	Rectangular or Chessboard	Streets are grid-like, with parallel streets intersected by perpendicular streets.
	Rayed	Streets that fan out at various angles from a given focal point and through less than 360 degrees.
	Radial	Primary thoroughfares radiate out from a central point. These streets may be extended outward 360 degrees around the central point or within an arc from a point along a natural barrier, such as a coastline.
	Radial-Ring	Loops or rings are surrounded by successively larger ones. Usually found in conjunction with larger radial patterns. Radial rings incorporate the elements of both radial and ring/concentric designs.
	Contour Forming	Pronounced terrain relief influences construction of roadways along lines of elevation. Primary streets run parallel to contour lines, with intersecting roads connecting them.
	Irregular Pattern	Irregular street patterns have been specifically engineered without geometric patterns for aesthetic or functional reasons. An American subdivision with curving streets and cul-de-sacs is an example.
	Combined Pattern	Any combination of the above and is best demonstrated by the development of high rise and business districts in Medieval or pre-Medieval cities.
	Linear Pattern	A primary thoroughfare radiates down the center with buildings on either side. American strip malls and main shopping districts are patterned this way for ease and convenience.

Figure 2-11. Street patterns and effects.

2-4. SPECIAL TERRAIN CONSIDERATIONS

Several special considerations have implications in a terrain analysis and must be considered when developing the tactical plan for combat. Special terrain products must be developed to include specialized overlays, maps, and plans augmented by vertical or hand-held imagery. The depiction of obstacles, avenues of approach, key terrain, observation and fields of fire, and cover and concealment must focus on the terrain analysis. While much of this information is provided by the battalion S2 (Figure 2-12, page 2-10), the company commanders must analyze the terrain that affects the execution of their mission, and provide the results of the analysis to platoon leaders. This mission is accomplished in the same manner as other operations, using the OCOKA factors. Figure 2-13, on page 2-11, depicts a sample terrain analysis based on a company's specific objective area. The amount and type of information included in this analysis is time dependent.

	City Core	Core Periphery	Dispersed Residential Area	High – Rise Area	Industrial Transportation Area	Permanent or Fixed Fortifications
Observation & Fields of Fire **O**	-Bldgs 15-20 stories. -Short lines of sight reduced ranges of weapon systems. -Lighting may hinder NVGs	-Bldgs 5-10 stories. -Increased fields of view. -Longer lines of sight. -More distinct building types.	-Lighting may hinder NVGs. -Building normally 1-2 stories.	-Multi-story apartment and office -Building(10-50 stories) -Mid-long lines of sight.	-Potential obscuration due to fire. -Many open areas.	-Defender has advantage. -Pre-positioned observation posts.
Cover and Concealment **C**	-Mix of commercial buildings., and construction types. -Best cover available.	-Close grouping or attached housing. -Variety of construction types. -Potential limits cover.	-Lighter construction buildings.	-Large open areas adjacent to high-rise building framed heavy, light clad con-struction.	-Working materials and cargo offer multiple position. -Framed, light clad buildings, some brick.	-Normally limited for the attacker and reinforced to the defender.
Obstacles **O**	-Greater number of civilian vehicles.	-Greater number of civilian vehicles.	-Possible power lines, poles, and cell phone towers as obstacles for a/c. -Increased number of civilians.	-Access to stairwells may be limited.	-Potential secondary explosions due to flammable and explosive hazards and chemical hazards.	-Limited access due to modification of existing structures. -Obstacles supported by fire.
Key Terrain **K** **NOTE: Key terrain can be found in all urban zones**	-Radio -Subway -Telephone exchange -Television -Utilities -Intersection -Govt Center	-Water systems -Bridges -Stadiums -Sewer systems -Hospitals -Parks	-Major road network. -Schools -Churches -Municipal buildings (City Halls). -Community centers, -Helipads	-Banking center	-Chemical production plant. -Railroad control center. -Trucking center.	-None in AO. -One in AI.
Avenues of Approach **A**	-Average street width is 26 meters. -Increased vehicular movements. -Streets form rectangular patterns. -Best mounted movement.	-Narrow and or winding streets. -Connected buildings offer routes (rooftops). -Subterranean areas.	-Average street width is 14 meters. -Building 6-8m back from woods. -Street pat-terns rec-tangular or curved.	-Tall build-ings limited air avenues of approach.	-Normally lo-cated along major road and highway routes. -Flat roofs and open areas offer possible LZs.	-Canalized and covered by fire.

Figure 2-12. Sample S2's urban terrain analysis matrix.

NOTE: The figure above is only one example of an urban terrain analysis matrix; information may be provided in different forms. The S2 includes as much information as time permits. The battalion's AO and AI may or may not include all the zones described in paragraph 2-3a.

Observation & Fields of Fire O	Cover & Concealment C	Obstacles O	Key Terrain K	Avenues of Approach A
- Bldgs 1-3 stories. - Short lines of sight. . LOS from Bldg 1 to Bldg 3 and Bldg 1 to Bldg 2. - ATGM use restricted. - Observation & fields of fire improve on north side of objective. - Good tank field of fire from parking lot on east side of objective.	- Bldg 1: Mass, reinforced concrete. - Bldg 2: Mass, triple brick. - Bldg 3: Framed, light clad block. - Friendly and threat smoke.	- Noncombatants - Burned out vehicles. - Rubble in front of Bldg 2. - Probable booby traps in doors and windows.	- Bldg 3 (Co Obj) - Sewer system. - Bldg 1 (Foothold)	- Average street width 15-25 meters. - Mounted approaches from all cardinal directions. - Sewer system between Bldgs 2 & 3.

Figure 2-13. Company urban terrain analysis matrix.

a. Military maps, normally the basic tactical terrain analysis tool, do not provide sufficient detail for a terrain analysis in urban areas. Leaders' reconnaissance and aerial imagery become much more important in urban terrain. Subterranean features (sewer systems, subway systems, and underground water systems), elevated railways, mass transit routes, fuel and gas supply and storage facilities, electric power stations and emergency systems, and mass communications facilities (radio, telephone) are often not depicted on military maps.

(1) Sewer and subway systems provide covered infiltration and small-unit approach routes. Elevated railways and mass transit routes provide mobility between city sectors, and point to locations where obstacles might be expected. Utility facilities are key targets for insurgents and terrorists, and their destruction can hinder the capabilities of a defending force. Utility facilities may become key terrain for certain missions or may have to be safeguarded and protected under ROE.

(2) Due to growth, urban areas are constantly adding new structures and demolishing existing ones. Therefore, any map of an urban area, including city maps or plans published by the city, state, or national government, may be inaccurate and or obsolete.

b. The nature of combat can radically alter the terrain in an urban area in a short period. Incidental or intentional demolition of structures can change the topography of an area and destroy reference points, create obstacles to mobility, and provide additional defensive positions for defenders.

c. Certain public buildings must be identified during the terrain analysis. Hospitals, clinics, and surgical facilities are critical because the laws of war prohibit their attack when they are being used solely for medical support. The locations of civil defense, air raid shelters, and food supplies are critical in dealing with civilian affairs. The same is true during insurgency, guerrilla, or terrorist actions. Again, these facilities may become key terrain for certain missions or may have to be safeguarded and protected under ROE.

d. Stadiums, parks, sports fields, and school playgrounds are of high interest during operations in urban areas. They provide civilian holding areas, interrogation centers, insurgent segregation areas, and prisoner of war holding facilities. These open areas also

provide landing zones (LZ) and pick up (PZ) zones. They provide logistical support areas and offer air resupply possibilities because they are often centrally located within a city or city district.

e. Construction sites and commercial operations, such as lumberyards, brickyards, steelyards, and railroad maintenance yards, serve as primary sources of obstacle and barrier construction materials when rubble is not present or is insufficient. They can also provide engineers with materials to strengthen existing rubble obstacles or with materials for antitank hedgehogs or crib-type roadblocks.

f. Roads, rivers, streams, and bridges provide high-speed avenues of approach. They also provide supporting engineer units locations to analyze demolition targets and to estimate requirements for explosives. When conducting navigation, do not rely on street signs as accurate navigation aids, and do not expect all bridges to be passable.

g. Public baths, swimming facilities, car washes, and cisterns are useful in providing bathing facilities. They also provide an alternate water source when public utilities break down or for use as decontamination facilities.

h. A close liaison and working relationship should be developed with local government officials and military forces. In addition to information on items of special interest, they may provide information on the population, size, and density of the urban area; fire-fighting capabilities; the location of toxic industrial materials (TIM); police and security capabilities; civil evacuation plans; and key public buildings. They may also provide English translators, if needed.

2-5. SPECIAL WEATHER CONSIDERATIONS

Terrain and weather analyses are inseparable. Leaders should include the weather's effects on the urban terrain during terrain analysis. Leaders must consider the military aspects of weather when planning missions.

a. **Visibility**. Light data have special significance during urban operations. Night and periods of reduced visibility, to include fog, favor surprise, infiltration, detailed reconnaissance, attacks across open areas, seizure of defended strong points, and reduction of defended obstacles. However, the difficulties of night navigation in restrictive terrain, without reference points and in close proximity to the threat, forces reliance on simple maneuver plans with easily recognizable objectives. Many urban areas are located along canals or rivers, which often create a potential for fog in low-lying areas. Industrial and transportation areas are the most affected by fog due to their proximity to waterways. In heavy industrial areas, smog can also limit observation under all light conditions.

b. **Winds**. Wind chill is not as pronounced in urban areas. However, the configuration of streets, especially in close-orderly block and high-rise areas, can cause wind canalization. This factor increases the effects of the wind on streets that parallel the wind direction, while cross-streets remain relatively well protected. Because of these factors, swirling winds occur and the wind speed and direction may constantly change. This factor also affects the use of smoke for both friendly and threat forces. Downwind predictions for NBC and TIM are also difficult.

c. **Precipitation**. Rain or melting snow often flood basements and subterranean areas, such as subways. This statement is especially true when automatic pumping facilities that normally handle rising water levels are deprived of power. Rain also makes

storm and other sewer systems hazardous or impassable. Chemical agents and other TIM are washed into underground systems by precipitation. As a result, these systems may contain toxic concentrations much higher than surface areas and become contaminated "hot spots." These effects become more pronounced as chemical agents or TIM are absorbed by brick or unsealed concrete sewer walls.

d. **Temperature and Humidity.** Air inversion layers are common over cities, especially cities located in low-lying "bowls" or in river valleys. Inversion layers trap dust, chemical agents, and other pollutants, reducing visibility and often creating a greenhouse effect, which causes a rise in ground and air temperature.

(1) The heating of buildings during the winter and the reflection and absorption of summer heat make urban areas warmer than surrounding open areas during both summer and winter. This difference can be as great as 10 to 20 degrees, and can add to the already high logistics requirements of urban combat. Summer heat, body armor and other restrictive combat equipment, combined with the very physical requirements of urban combat, can cause severe heat-related injuries.

(2) Changes in temperature as a result of air inversions can also affect thermal sights during crossover periods of warm to cold and vice-versa. This period should be identified as it may differ from urban area to urban area.

(3) Extremely cold temperatures and heavily constructed buildings may affect target identification for thermal sights. For example, thick walls may make combat vehicle identification difficult by distorting hotspots and increased use of heaters and warming fires may clutter thermal sights with numerous hotspots.

2-6. ANALYSIS OF OTHER CHARACTERISTICS

Because these aspects vary greatly, a comprehensive list cannot be provided. However, other urban characteristics include:

- Sources of potable water.
- Bulk fuel and transport systems.
- Canals and waterways.
- Communications systems.
- Rail networks, airfields, and other transportation systems.
- Industries.
- Power production facilities and public utilities.
- Chemical and nuclear power production facilities.

2-7. APERTURE ANALYSIS

During offensive operations, a key function that the company commander must perform is an aperture analysis of the buildings that he is responsible for attacking. This analysis enables him to determine the number of apertures (windows, doors, holes due to weapons effects) in the building. It also provides key information that he needs to know about the buildings in order to accomplish his mission, such as apertures to be suppressed and where possible points of entry and exit are. (A similar application can be applied in the defense to determine how the enemy would attack buildings that friendly units are defending.) A technique for conducting this analysis is shown in Figures 2-14 and 2-15 on page 2-14. Information can be modified to suit specific situations. This information is obtained from the S2's IPB; reconnaissance from higher headquarters; company

reconnaissance efforts; HUMINT sources, such as local inhabitants; and any other information sources available. As much mission-essential information is analyzed within the time constraints possible. The analysis then assists in determining how the company attacks. While the actual plan may have to be modified during execution, this process can assist in formulating what type of weapons or explosives may be effective and also assist in determining courses of action for mission execution.

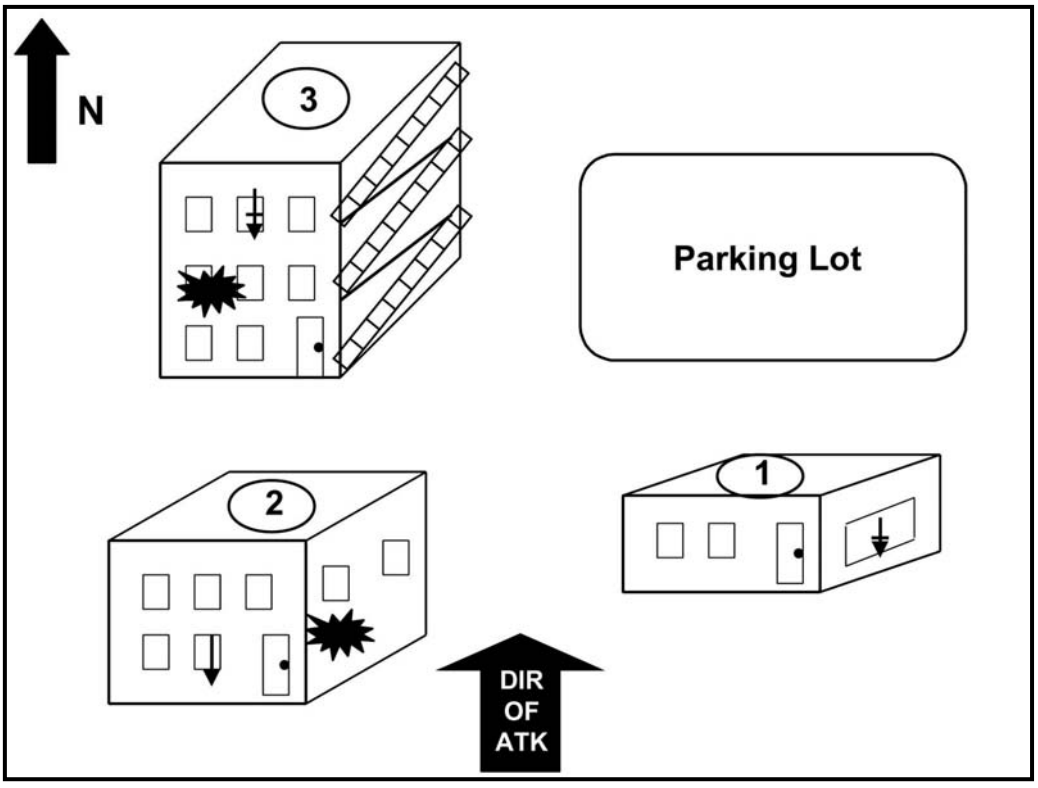


Figure 2-14. Aperture analysis (buildings comprising the company objective).

Bldg No	Construction Type	Floors	Rooms	Stair Wells	Basements Y/N/U	Apertures	Dir of Fire	Loc of Req Suppress (Entry/Exit)	Known Threat
1	Mass Brick	1	3	None	Unk	3 x S 1 x E	360-90 360-90	None Window E	Med MG
2	Mass Brick	2	6	1 Inside	Unk	6 x S 3 x E	270-90 270-360	Window 2, 1st Floor Entry thru Mouse Hole	Sqd (-) Light MG
3	Framed, Block	3	9	3 Inside/ Outside	Yes	9 X S	270-90	Window 2, 3rd Floor Entry thru Door	Sqd (-) Med MG

Figure 2-15. Completed aperture analysis for an attack.

2-8. QUESTIONS FOR COMMANDERS AND LEADERS

Commanders and leaders should be able to answer the following questions after they have completed their terrain and weather analyses.

- Where are the streets, alleys, "through-building" routes, subterranean passageways, that provide mounted and dismounted avenues of approach and mobility corridors within the company's AO?
- What are the number, types, and strength of buildings in the AO?
- What and where is the rubble that helps or hinders company movement?
- Which buildings present fire hazards to assault or support elements?
- Where are the building locations for support-by-fire positions (ability to withstand backblast or overpressure, ability to support vehicle weight)?
- How many kill zones (parking lots, streets, rooftops, wide boulevards) are in the AO?
- Which buildings, rooftops, intersections, or other surrounding terrain provides observation and fields of fire?
- What is the number of apertures for each building in the objective area, building composition, and likely weapons needed to suppress and breach?
- What are the current conditions of the objective area and the effects of preparatory fires?
- Where is a location for a reserve?
- Where are the counterattack routes?
- Where are the urban terrain features on which to place control measures?
- What are the locations for local medical treatment facilities?
- What are the effects on smoke and obscuration?
- Where are locations for company resupply operations?
- Where are the locations to procure barrier materials?
- Where are utilities and fuel sources?
- Where are phone systems and other potential communication systems?
- What are the effects of weather on men and equipment (visibility, temperature, precipitation, humidity, survivability, and mobility)?
- Where are the locations of noncombatants and what is their disposition to friendly and enemy forces (hostile, friendly, neutral)?

Section III. URBAN BUILDING ANALYSIS

This part of the analysis is very important for commanders, leaders, and staffs. Commanders and leaders must be capable of identifying the types of buildings that are in their company sectors, objective areas, and areas of influence. They must also understand the effects of weapons that are used against those buildings. The capability of identifying building types and understanding weapons effects enables commanders to give clear instructions to their subordinates concerning mission execution. It also assists the platoon and the squad leaders in choosing the appropriate weapons or explosives to accomplish their respective missions. (See Chapter 7 for more information.)

2-9. TYPES OF MASS-CONSTRUCTION BUILDINGS

Mass-construction buildings (Figure 2-16) are those in which the outside walls support the weight of the building and its contents. Additional support, especially in wide buildings, comes from using load-bearing interior walls, strongpoints (called pilasters) on the exterior walls, cast-iron interior columns, and arches or braces over the windows and doors.

a. **Modern Mass-Construction Buildings.** Modern types of mass-construction buildings are wall and slab structures, such as many modern apartments and hotels, and tilt-up structures commonly used for industry or storage. Mass-construction buildings are built in many ways:

- The walls can be built in place using brick, block, or poured-in-place concrete.
- The walls can be prefabricated and "tilt-up" or reinforced-concrete panels.
- The walls can be prefabricated and assembled like boxes.

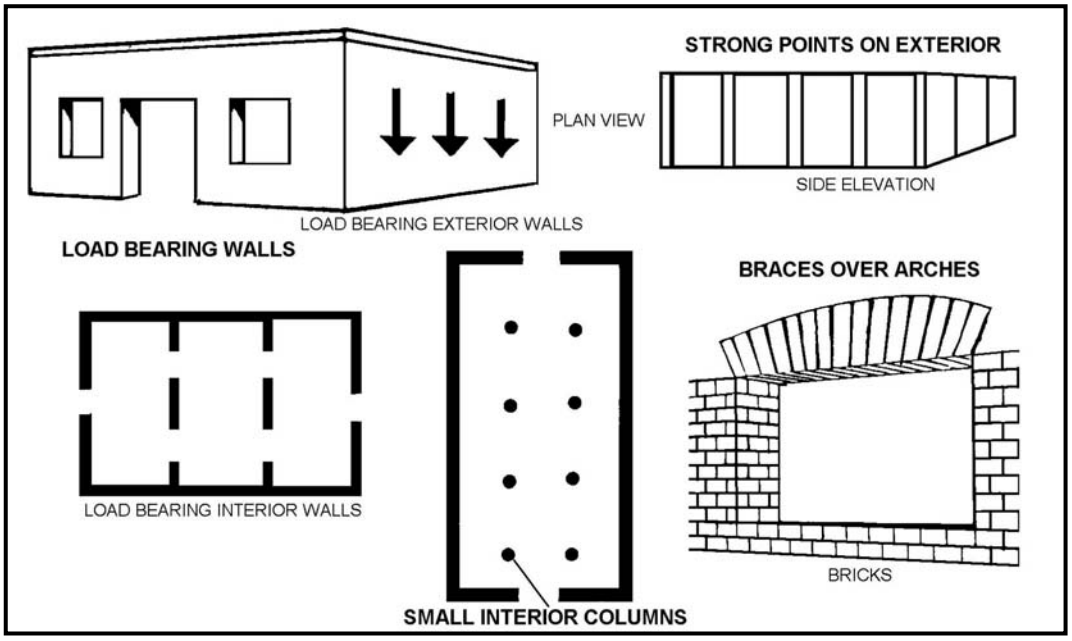


Figure 2-16. Mass-construction buildings.

b. **Brick Buildings.** Brick buildings are the most common mass-construction buildings. In Europe, brick buildings are commonly covered with a stucco veneer so that bricks do not show (Figure 2-17). One of the most common uses of brick buildings is the small store. These buildings are found in all urban areas but are most common in the dense random construction and close-orderly block areas (Figure 2-18).

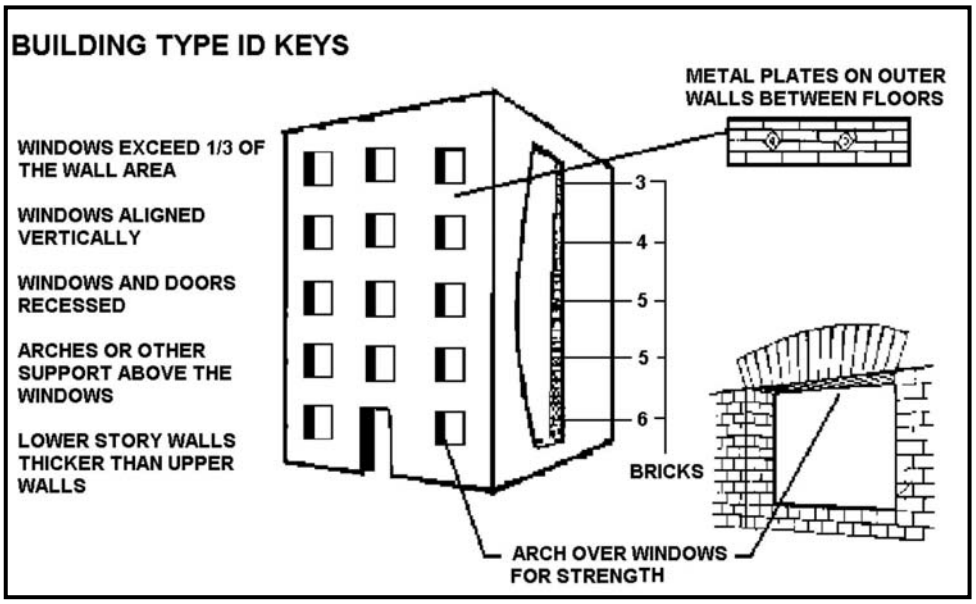


Figure 2-17. Brick buildings.

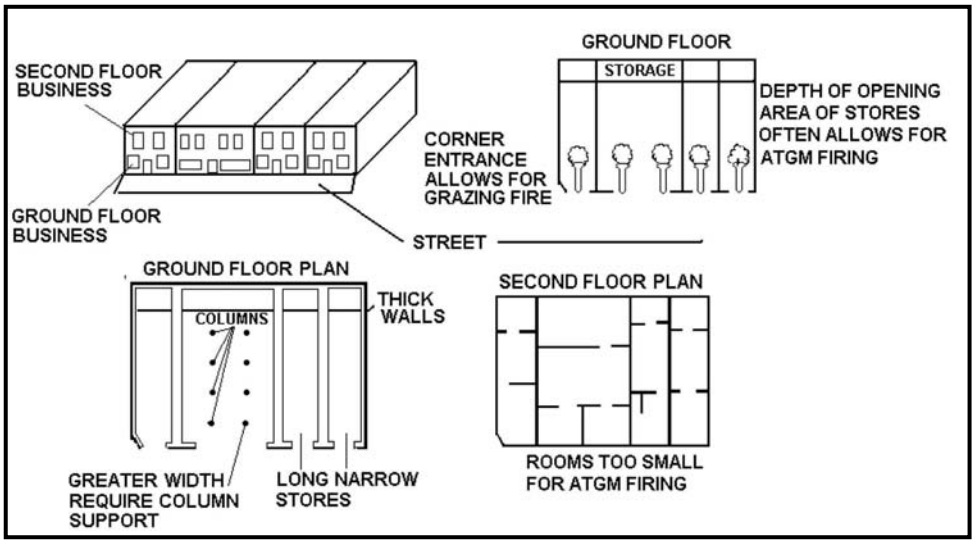


Figure 2-18. Brick structures.

c. **Warehouse.** Another common mass-construction building in the industrial-transportation zone is the warehouse. It is built of poured-in-place concrete reinforced with steel bars or of prefabricated "tilt-up" walls. The walls of warehouses provide good cover, although the roof is vulnerable. The warehouses' large open bays permit ATGM firing and, because they are normally found in outlying areas, often afford adequate fields of fire. These buildings are built on slabs, which can normally support the weight of vehicles and can provide excellent cover and concealment for tanks (Figure 2-19).

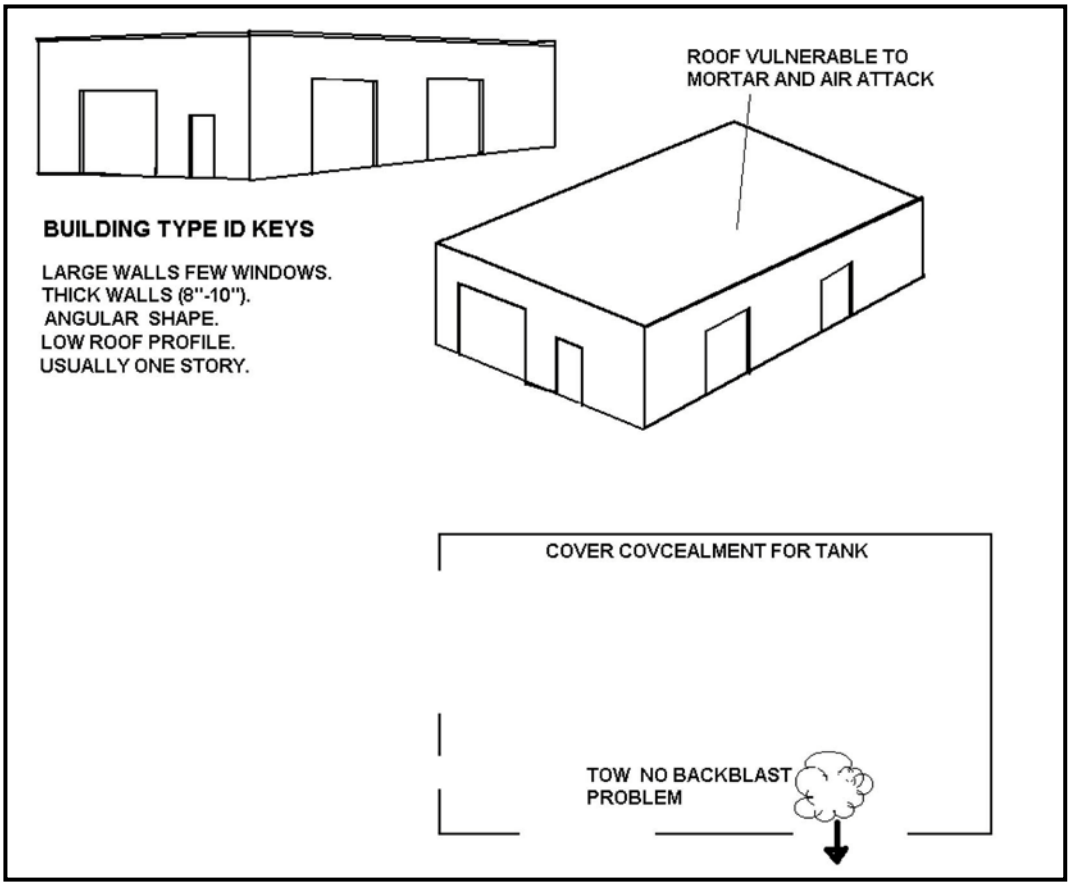


Figure 2-19. Warehouse.

d. **Box-Wall Type.** Another mass-construction building is the box-wall principle type. It is made from prefabricated concrete panels, which are made of 6- to 8-inch-thick reinforced concrete. The outside wall is often glass. The box-wall principle building provides good cover, except at the glass wall. The rooms are normally too small for ATGMs to be fired. A good circulation pattern exists from room to room and from floor to floor. These buildings are commonly used as hotels or apartments and are located in high-rise areas (Figure 2-20).

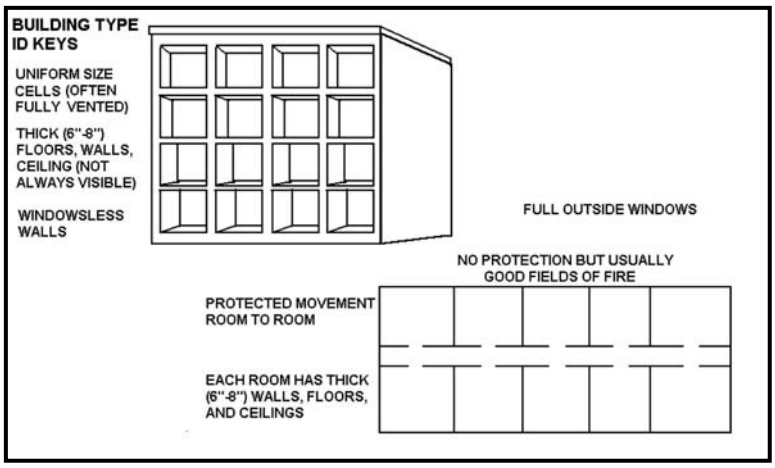


Figure 2-20. Box-wall principle building.

e. **Public Gathering Places.** Public gathering places (churches, theaters) are mass-construction buildings with large, open interiors. The walls provide good cover, but the roof does not. The interior walls are not load bearing and are normally easy to breach or remove. These buildings have adequate interior space for firing ATGMs. They are often located next to parks or other open areas and, therefore, have fields of fire long enough for ATGMs. Public gathering places are most common in the dispersed residential and high-rise areas (Figure 2-21).

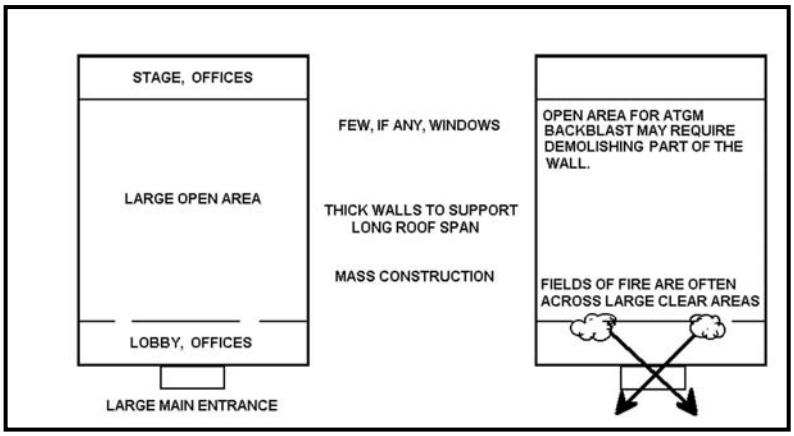


Figure 2-21. Public gathering places.

2-10. TYPES OF FRAMED BUILDINGS

Framed buildings are supported by a skeleton of columns and beams and are usually taller than frameless buildings (Figure 2-22). The exterior walls are not load bearing and are referred to as either heavy clad or light clad. Another type of framed building often found in cities is the garage, which has no cladding.

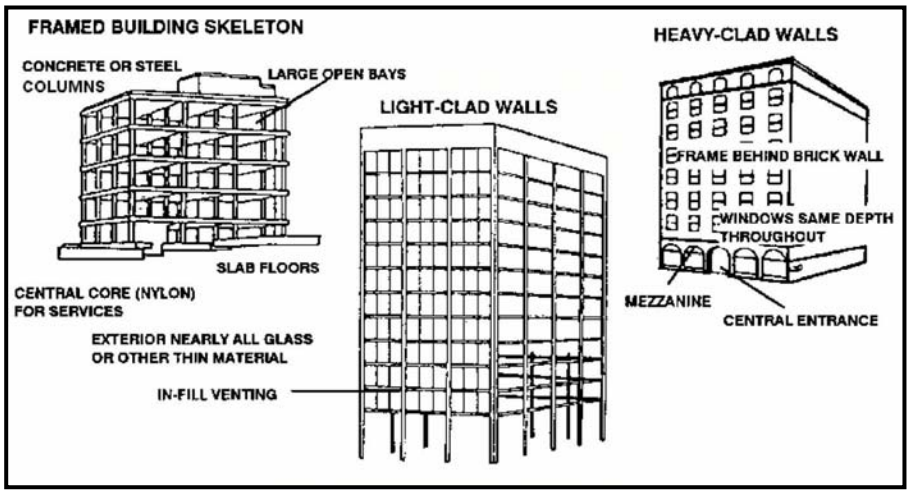


Figure 2-22. Framed buildings.

a. **Heavy-Clad Framed Buildings.** Heavy-clad buildings were common when framed buildings were first introduced. Their walls are made of brick and block that are sometimes almost as thick as frameless brick walls, although not as protective. Heavy-clad framed buildings are found in the city core or core periphery. They can be recognized by a classic style or architecture in which each building is designed with three sections: the pediment, shaft, and capital. Unlike the brick building, the walls are the same thickness on all floors, and the windows are set at the same depth throughout. Often the frame members (the columns) can be seen, especially at the ground floor. The cover provided from the cladding, consisting of layers of terra cotta blocks, brick, and stone veneer, is not as good as cover from the walls of brick buildings. It protects against small-arms fire and light shrapnel but does not provide much cover against heavy weapons (Figure 2-23).

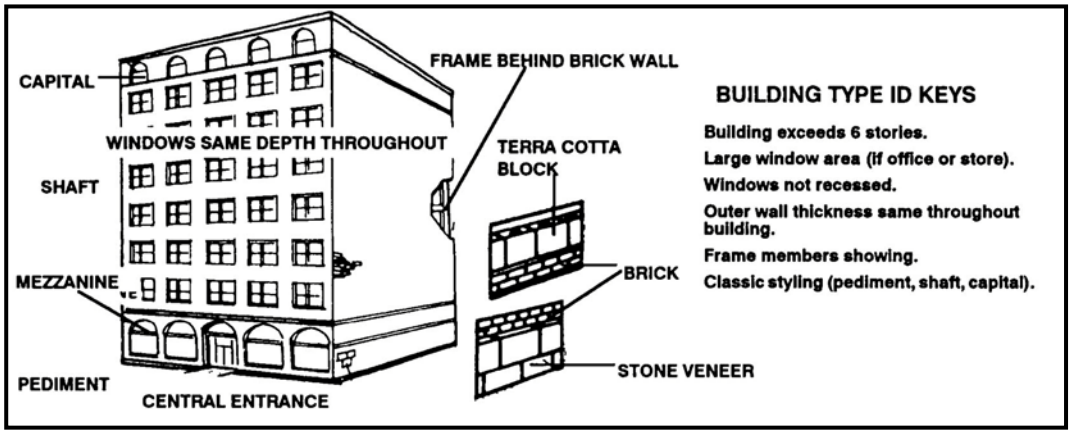


Figure 2-23. Heavy-clad framed building.

(1) The floor plans of these buildings depend upon their functions. Office buildings normally have small offices surrounding an interior hall. These offices have the same dimensions as the distance between columns (some large offices are as large as two times the distance between columns). These rooms are too small to permit firing of ATGMs but do provide some cover for snipers or machine gunners (Figure 2-24).

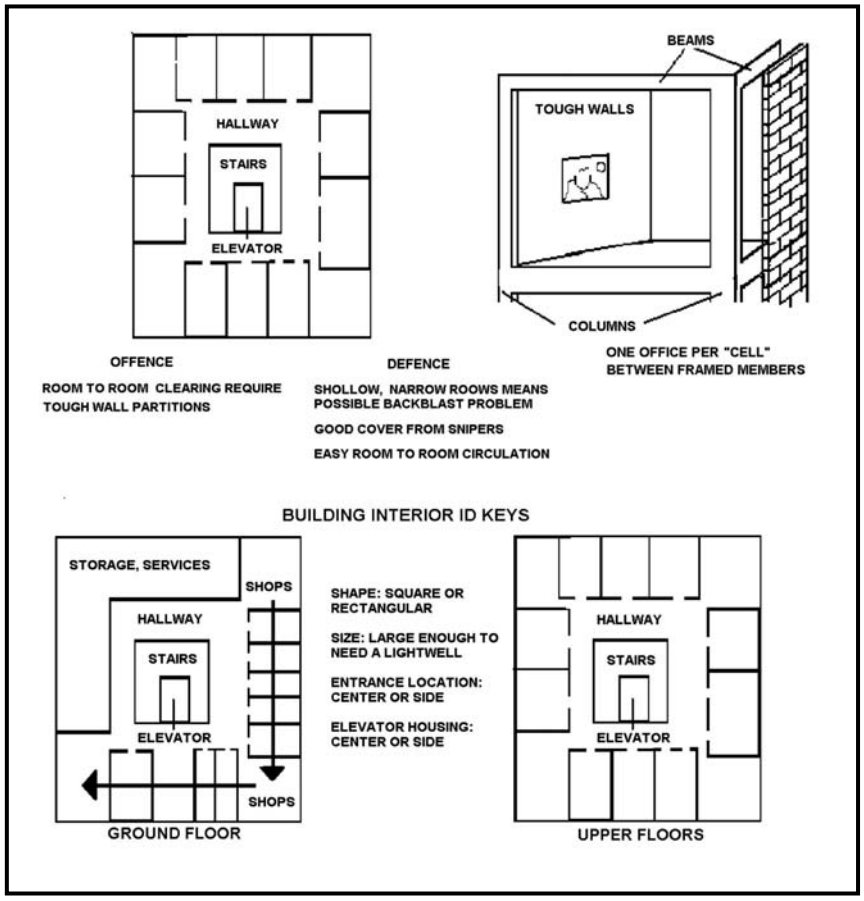


Figure 2-24. Floor plan of heavy-clad framed office.

(2) Department stores normally have large, open interiors (Figure 2-25, page 2-22). Such areas permit firing ATGMs (if there are adequate fields of fire). Often a mezzanine level with a large backblast area permits firing down onto tanks. Steel fire doors, which are activated by heat, often exist between sections of the store. Once closed, they are difficult to breach or force open, but they effectively divide the store into sections (Figure 2-26, page 2-22).

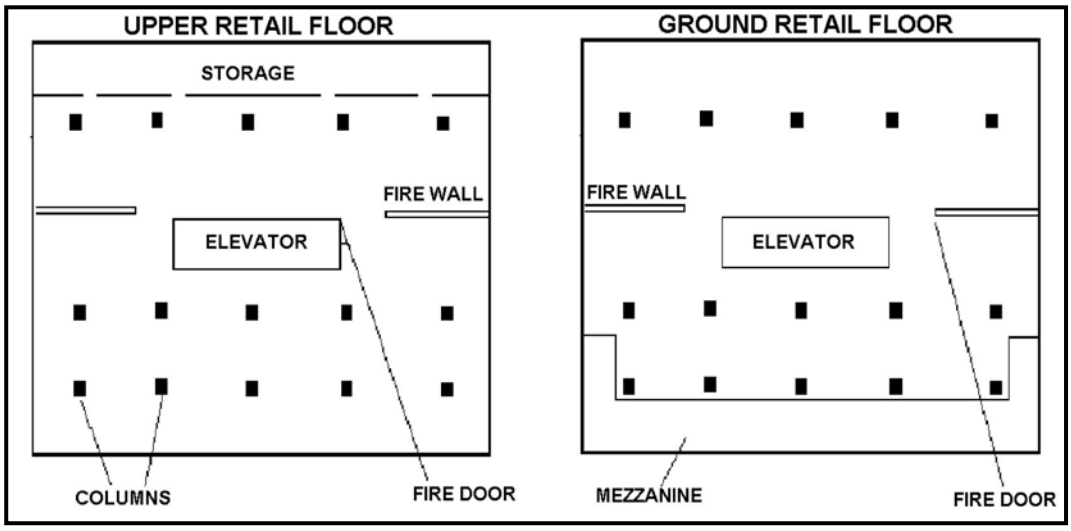


Figure 2-25. Heavy-clad framed department store.

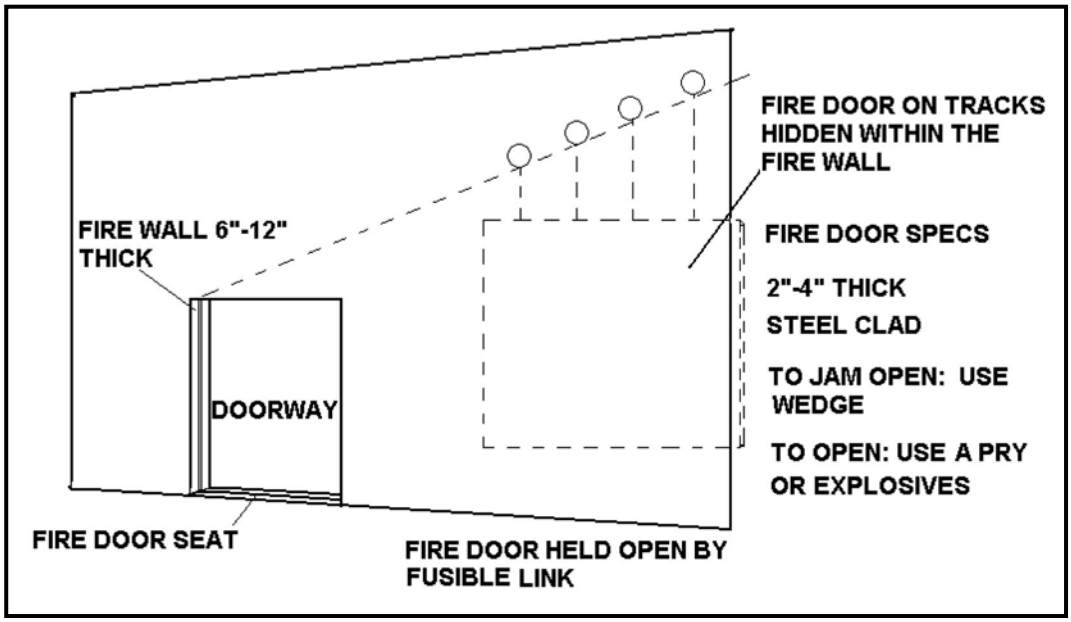


Figure 2-26. Fire wall and fire door.

(3) Another type of heavy-clad framed building is the high-rise factory (Figure 2-27). Such buildings are normally easily recognized because the concrete beams and columns are visible from the outside. They are usually located in older industrial areas. The large windows and open interior favor the use of ATGMs. Because the floors are often made to support heavy machinery, this building provides good overhead cover.

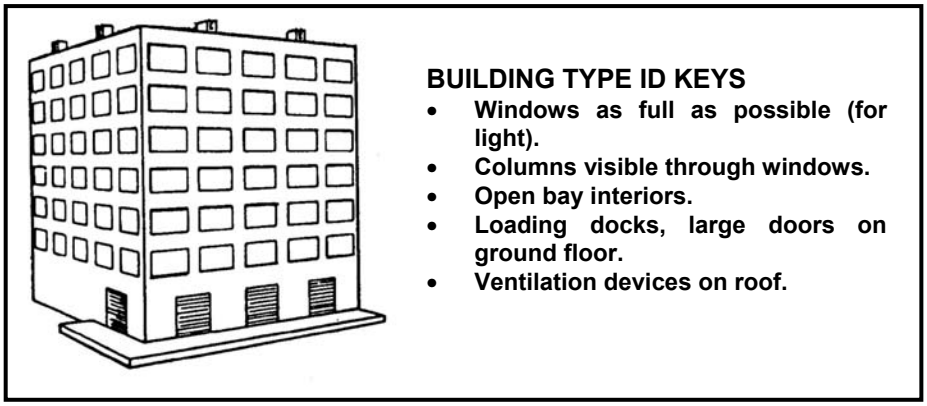


Figure 2-27. High-rise factory.

b. **Light-Clad Buildings.** Light-clad buildings are more modern and may be constructed mostly of glass (Figure 2-28). Most framed buildings built since World War II are light-clad buildings. They are found in both core and outlying high-rise regions. Their walls consist of a thin layer of brick, lightweight concrete, or glass. Such materials provide minimal protection against any weapon. However, the floors of the buildings are much heavier and provide moderate overhead cover. The rooms in light-clad framed buildings are much bigger than those in heavy-clad. This feature, along with the fact that the buildings usually stand detached from other buildings, favors the employment of ATGMs. The interior partitions are thin, light, and easy to breach (Figure 2-29, page 2-30).

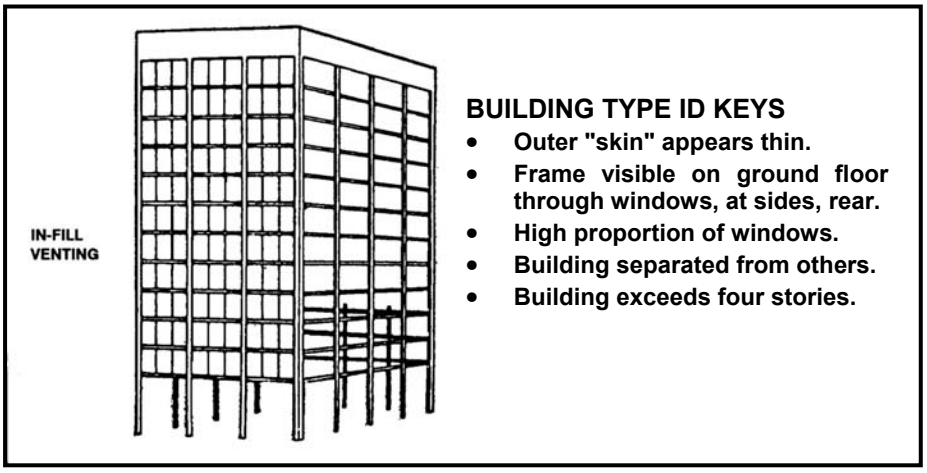


Figure 2-28. Light-clad framed building.

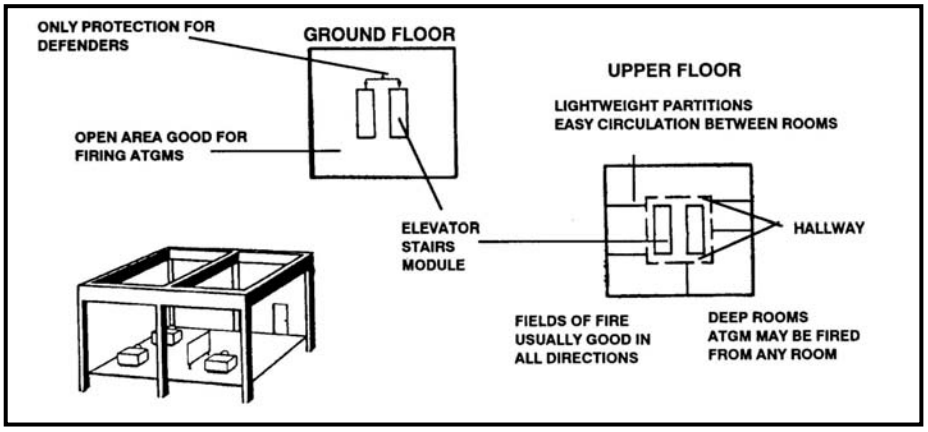


Figure 2-29. Light-clad framed room.

c. **Garage.** The garage (Figure 2-30) is one of the few buildings in an urban area in which all floors support vehicles. It provides a means to elevate vehicle-mounted TOWs, and the open interiors permit firing of ATGMs. Garages are normally high enough to provide a 360-degree field of fire for antiaircraft weapons. For example, a soldier equipped with a Stinger could hide under the top floor of the garage, come out to engage an aircraft, and then take cover back inside.

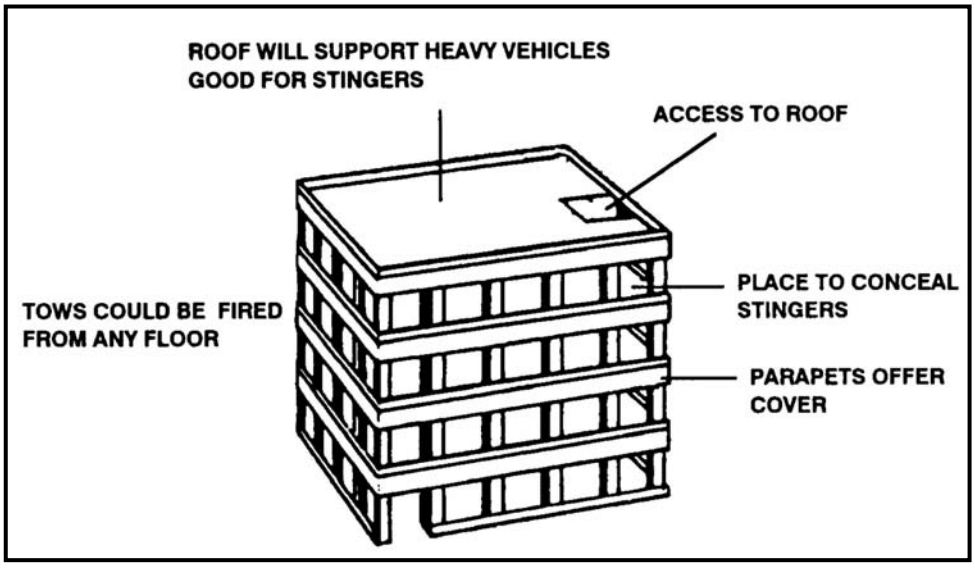


Figure 2-30. Garage.

2-11. FLOOR PLANS

The more common floor plans that units encounter are described in this paragraph.

a. **Brick Buildings.** The floor plans in brick buildings are usually different on ground floor levels than on upper levels (Figure 2-31).

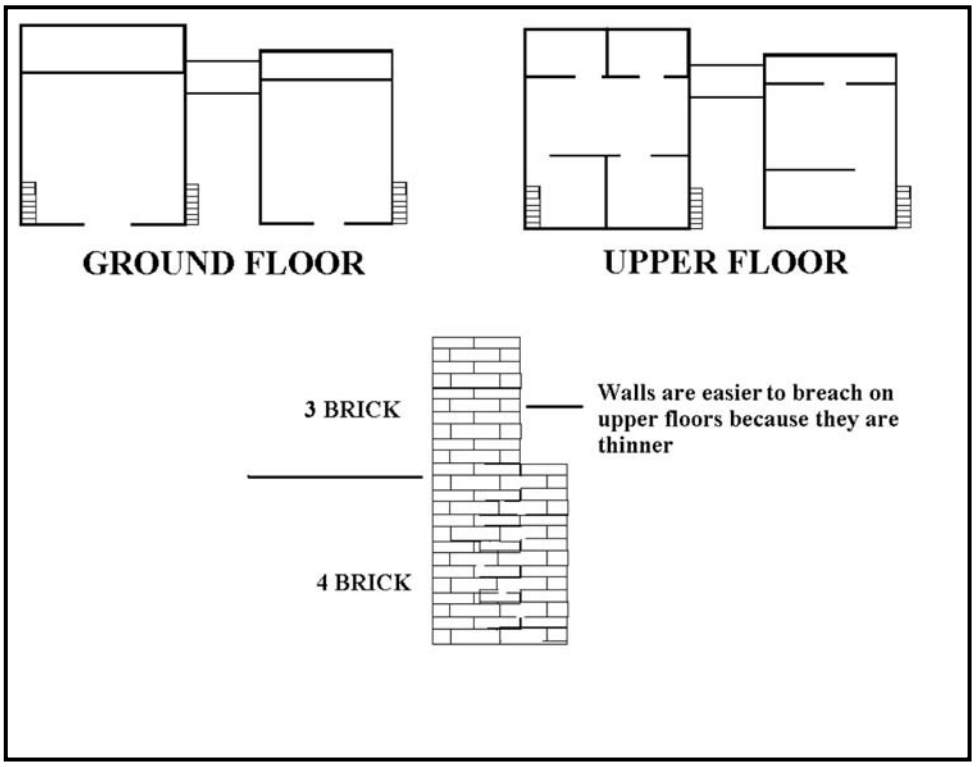


Figure 2-31. Brick building floor plans.

b. **Brick Houses.** Brick houses have similar floor plans on each floor (Figure 2-32); therefore, ground floors are cleared the same way as upper floors. The same recommendations for breaching and clearing brick buildings apply except that breaching deeply slanted roofs may be difficult.

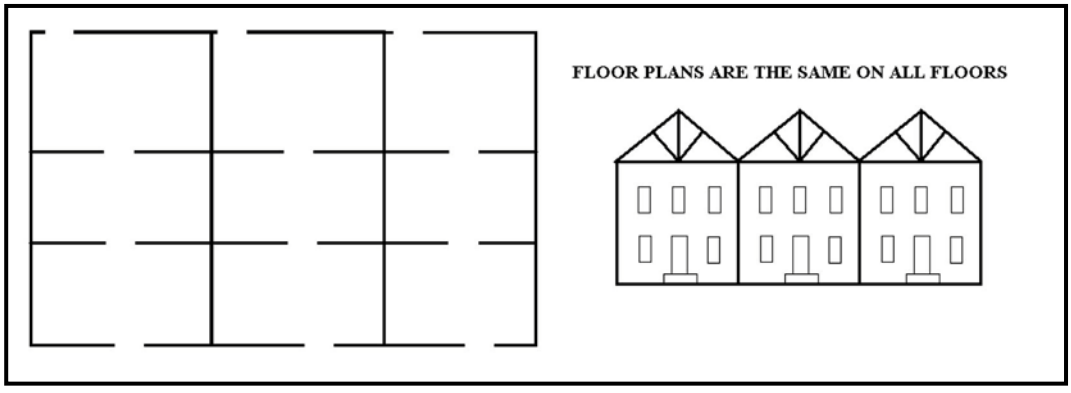


Figure 2-32. Brick house similar floor plans.

c. **Box-Wall Buildings.** Box-wall buildings often have reinforced concrete walls (Figure 2-33, page 2-26), which are difficult to breach due to the reinforcing bars. Therefore, the best way to enter is to breach through a door or one of the side windows.

The floor plans of these buildings are predictable. Clearing rooms is usually done from one main hallway. Interior walls are also constructed of reinforced concrete and are difficult to breach. The stairways at the ends of the building must be secured during clearing. If a wall breach is chosen, plans must be made to cut the reinforcing bars.

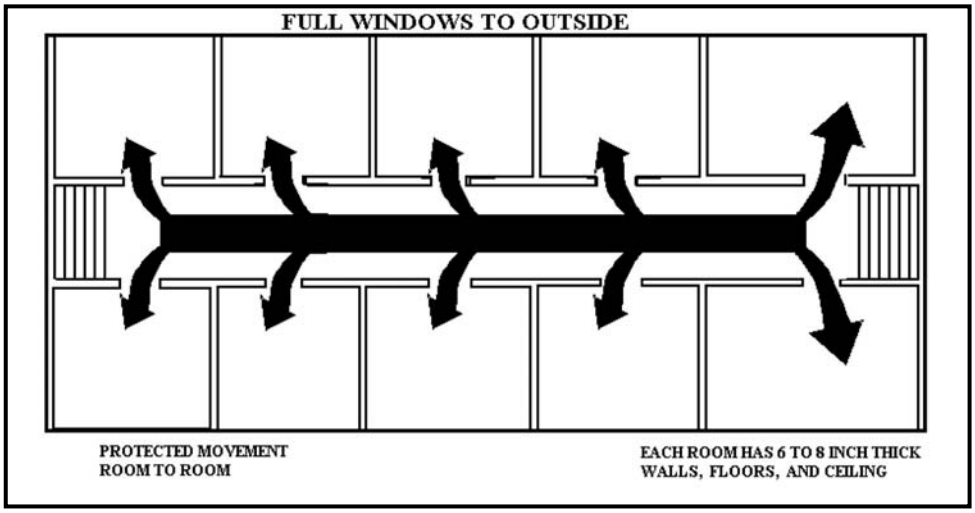


Figure 2-33. Box-wall buildings.

d. **Heavy Clad Framed Buildings.** Heavy-clad framed buildings are relatively easy to breach with explosive or ballistic breaching techniques. Their floor plans are oriented around a stairway or elevator, which must be secured during clearing (Figure 2-34). The interior walls of these buildings can be breached, although they may require use of explosives to be effective.

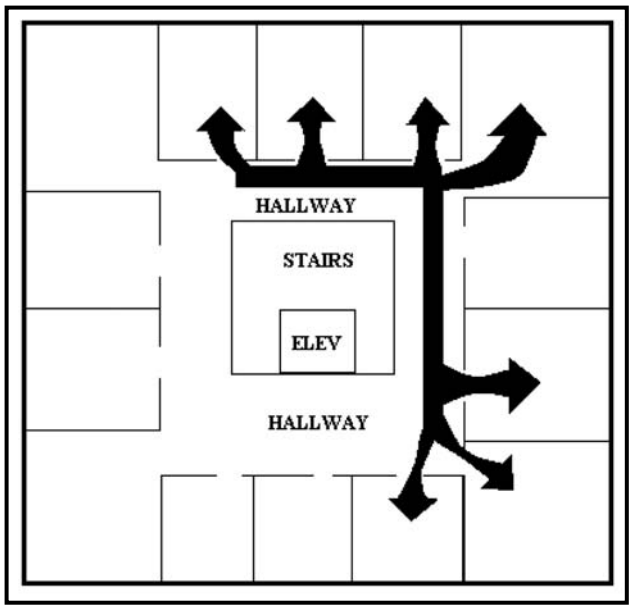


Figure 2-34. Heavy-clad framed building.

e. **Light-Clad Framed Buildings.** On light-clad framed buildings (Figure 2-35), the clearing tasks are usually the same: secure the central stairway and clear in a circular pattern. Walls are easier to breach since they are usually thinner.

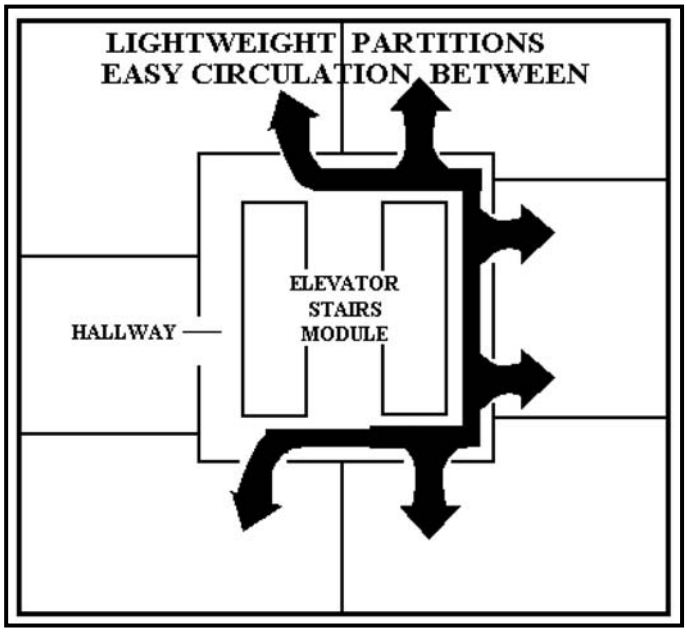


Figure 2-35. Light-clad framed building.

2-12. RESIDENTIAL AREAS

Residential houses in the western world are located in and around cities and in rural areas. Residential houses in cities are normally mass-construction brick buildings. Rural residential buildings in the continental US, South America, and Southeast Asia are commonly made of wood. In continental Europe, Southwest Asia, and Sub-Saharan Africa where wood is extremely scarce, rural buildings are normally constructed of concrete blocks (Figure 2-36, page 2-28). Another common type of building structure in cities with European influences is called the Hof-style apartment building (Figure 2-37, page 2-28). In the Mideast and tropical regions, the most common housing is the enclosed courtyard. Houses are added one to another with little regard to the street pattern. The result is a crooked, narrow maze, which is harder to move through or fire in than dense European areas (Figure 2-38, page 2-29).

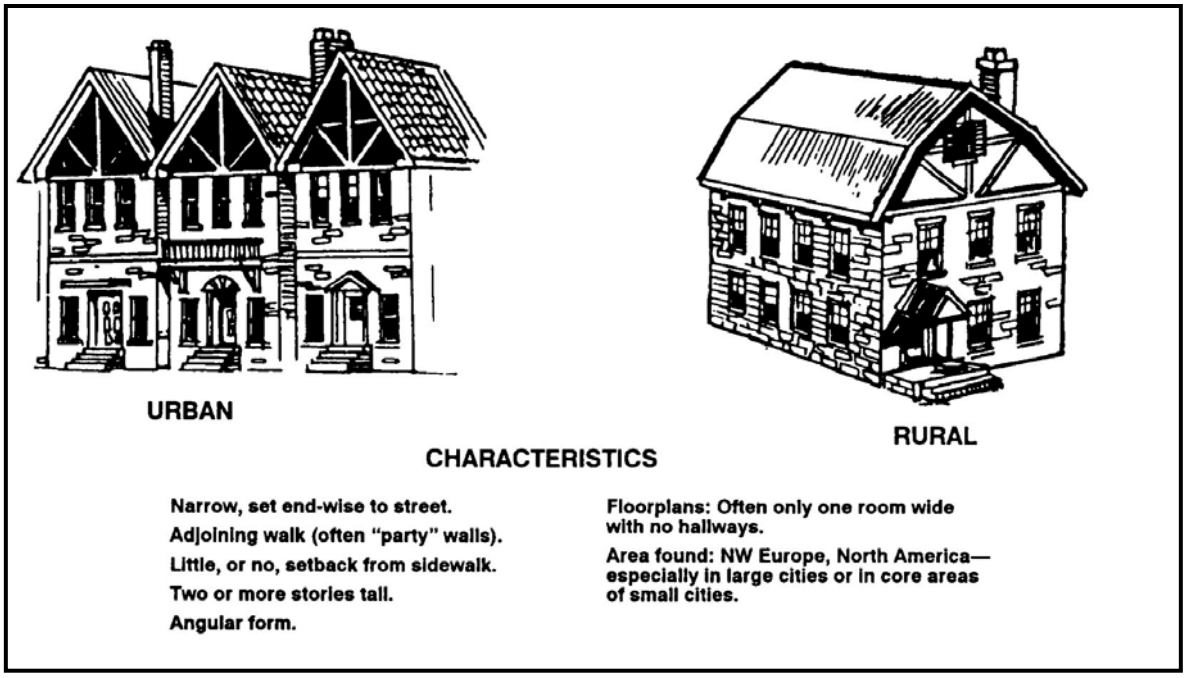


Figure 2-36. Types of housing.

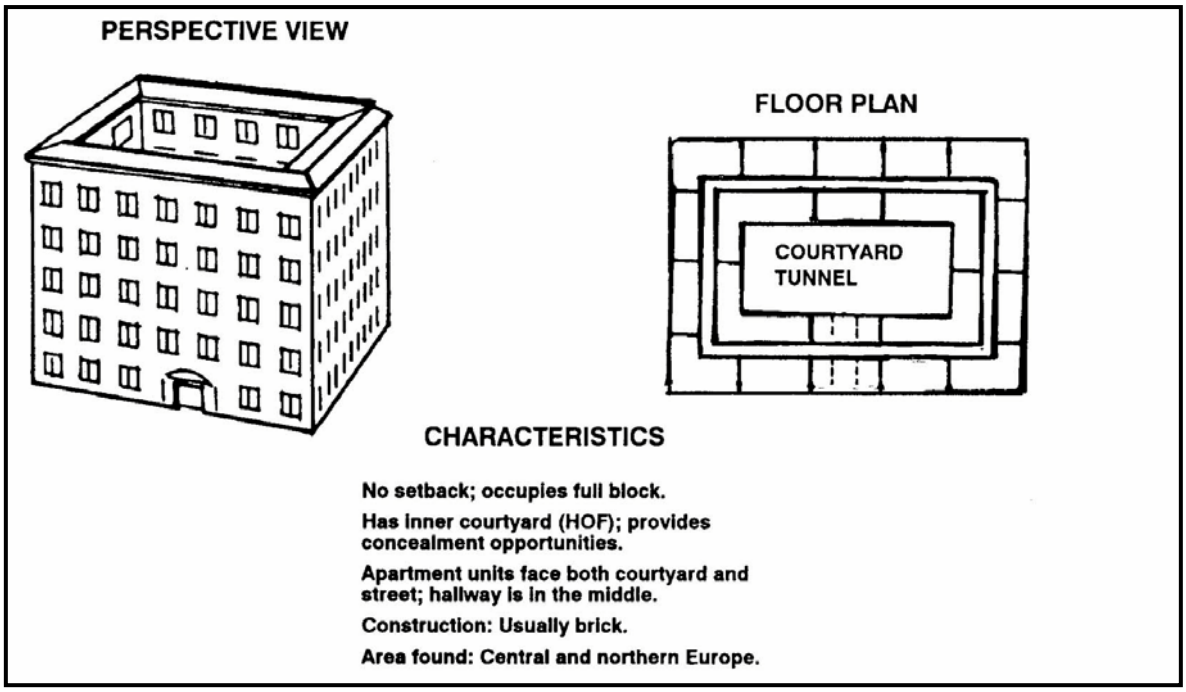
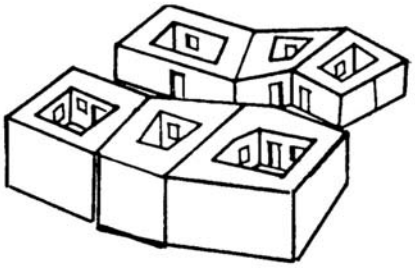


Figure 2-37. Hof-style apartment building.



CHARACTERISTICS

Windowless outer walls, inner courtyards.
Varying size, dimensions.
No setbacks.
One to two stories tall.
Flat roofs.
Floor plan: All rooms open onto courtyard.
Location: On narrow, curving streets with short horizontal lines of sight.
Area found: Middle East, north Africa, and Mediterranean.

Figure 2-38. Enclosed courtyard.

2-13. CHARACTERISTICS OF BUILDINGS

Certain characteristics of both mass-construction and framed buildings can be helpful in analyzing a urban area. Leaders can use Table 2-1 to determine the height and wall thickness of buildings in relation to the type of weapon they plan to use. (See Chapter 7 for weapons effects.)

TYPE OF CONSTRUCTION	BUILDING MATERIAL	HEIGHT (STORIES)	AVERAGE WALL THICKNESS (inches)
Mass	Stone	1 to 10	30
Mass	Brick	1 to 3	8 to 12
Mass	Brick	3 to 6	12 to 24
Mass	Concrete Block	1 to 5	8
Mass	Concrete Wall and Slab	1 to 10	8 to 15
Mass	Concrete “Tilt-ups”	1 to 3	7
Framed	Wood	1 to 5	6 to 8
Framed	Steel (Heavy Cladding)	3 to 50	12
Framed	Concrete/Steel (Light Cladding)	3 to 100	1 to 3

Table 2-1. Types of construction.

2-14. DISTRIBUTION OF BUILDING TYPES

Certain types of buildings dominate certain parts of a city, which establishes patterns within a city. Analysis of the distribution and nature of these patterns has a direct bearing on military planning and weapon selection (Figure 2-39, page 2-30).

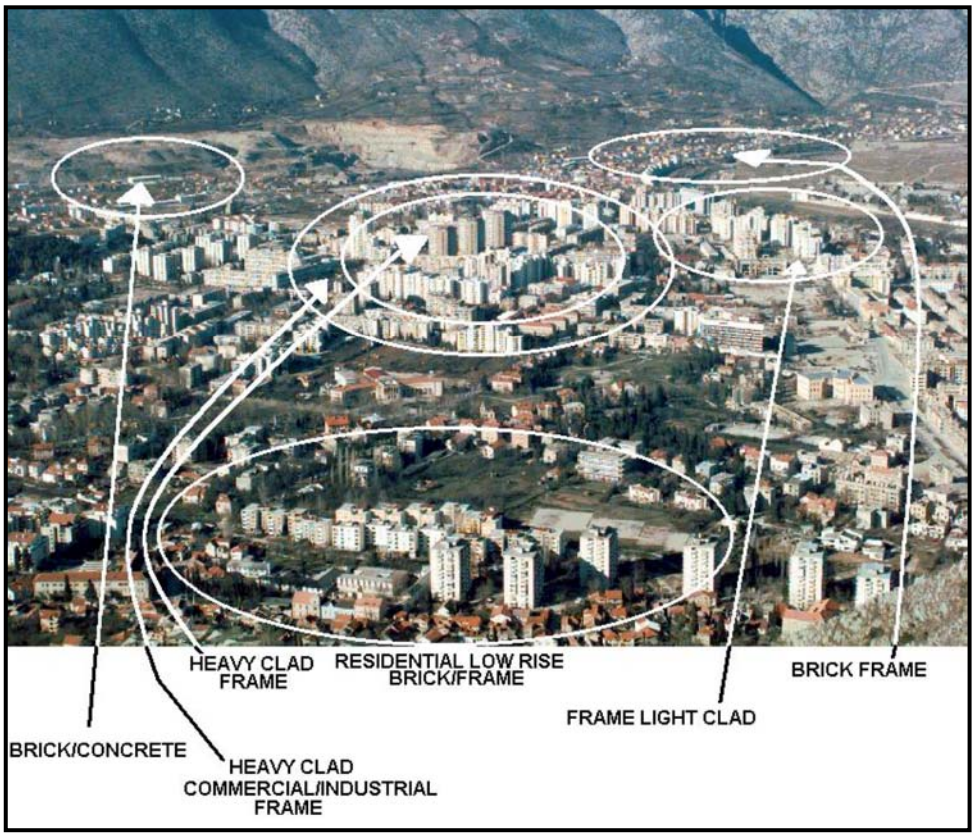


Figure 2-39. Distribution of building types.

a. **Mass Construction Buildings.** Mass-construction buildings are the most common structures in urban areas, forming about two-thirds of all building types. Brick structures account for nearly 60 percent of all buildings, especially in Europe.

b. **Framed Multistory Buildings.** Steel and concrete framed multistory buildings have an importance far beyond their one-third contribution to total ground floor area. They occupy core areas—a city's most valuable land—where, as centers of economic and political power, they have a high potential military significance.

c. **Open Space.** Open space accounts for about 15 percent of an average city's area. Many open spaces are grass-covered and are used for parks, athletic fields, and golf courses; some are broad, paved areas. The largest open spaces are associated with suburban housing developments where large tracts of land are recreation areas.

d. **Streets.** Streets serving areas consisting of mostly one type of building normally have a common pattern. In downtown areas, for example, high land values result in narrow streets.

(1) Street widths are grouped into three major classes:

- 7 to 15 meters, located in medieval sections of European cities.
- 15 to 25 meters, located in newer planned sections of most cities.
- 25 to 50 meters, located along broad boulevards or set far apart on large parcels of land.

(2) When a street is narrow, observing or firing into windows of a building across the street can be difficult because an observer is forced to look along the building rather than

into windows. When the street is wider, the observer has a better chance to look and fire into the window openings (Figure 2-40).

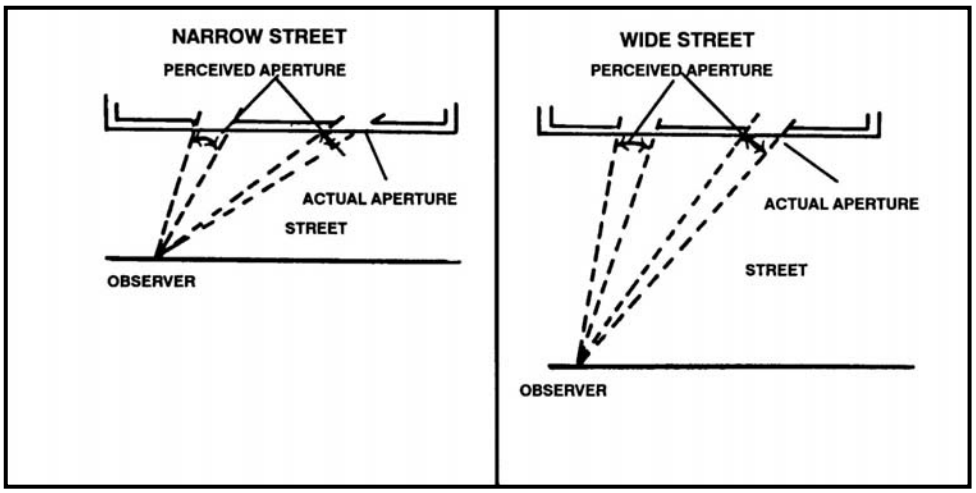


Figure 2-40. Line-of-sight distances and angles of obliquity.

Section IV. URBAN THREAT EVALUATION

Threat evaluation for urban combat uses a three-step process: developing a threat database, determining threat capabilities, and developing a doctrinal template file as threat evaluation for open terrain. The brigade and battalion S2 perform this function. Company commanders must use the information provided to determine the best method of mission accomplishment. (This process functions better against a conventional threat, such as a motorized rifle battalion. Units must also be prepared to fight unconventional threats. The process is essentially the same, however real-time or near real-time information must be used concerning the size of threat forces, arms and equipment, locations, and probable courses of action.) Due to the unique aspects of UO, certain operational factors and future threat capabilities must be recognized. These factors must be considered before preparing the required templates during threat integration of the IPB process.

2-15. OPERATIONAL FACTORS

The doctrinal concept of full spectrum operations and recent international developments presuppose the increasing chance of conflict or military intervention with regional and national threats. These conflicts may be combat operations against conventional forces of one or more Third World nations, combat operations against insurgent or asymmetrical threats, or military intervention in the form of stability and support operations.

a. **Conventional Threats and Planning Factors.** Most nations with conventional forces emphasize managing combined arms operations in urban areas. Among the conventional force structures, the poorer the nation, the less likely it is to field, maneuver, and sustain forces beyond logistic centers. Also, the extreme environment in some regions restricts operations beyond urban centers. Urban structural characteristics are shaped by social, cultural, and economic factors. These elements are the prime reasons

that UO doctrine and tactics differ between nations. Coupled with the restrictive nature of urban combat, the differences in tactics may be superficial. More than any other factor, the advent of high technology, precision weapons has enabled nations to modify and update their UO doctrine and tactics. Research has revealed many factors to consider in the planning and execution of UO. Some key factors are:

(1) Urban combat consumes time. A well-planned defense, even if cut off or lacking in air, armor, or artillery weapons, can consume a great deal of an attacker's time and resources.

(2) The ability to control military operations in highly decentralized circumstances remains the priority for both attacker and defender. Maintaining situational awareness becomes a matter of primary importance.

(3) The required size of the attacking force depends on the quality of intelligence, degree of surprise, and degree of superior firepower the attacker can achieve rather than the degree of sophistication with which the defender has prepared the urban area. Other considerations for determining the size of the attacking force are the amount of acceptable collateral damage and the amount of expected non-combatants.

(4) The degree of a defender's resistance depends on whether or not he is separated from the local population, is wholly or partly cut off from external support, or has effective or ineffective communication systems. The local population's attitude toward the defender also affects his degree of resistance.

(5) The belief that armor has no role in city fighting is wrong. Tanks, Infantry fighting vehicles (IFVs), and armored personnel carriers (APCs) have proven vital to the attacker inside the city as long as they are protected by Infantry.

(6) If the attacker is subject to any constraints, such as restrictive ROE, the defender has a good chance of prolonging the battle or forcing the attacker into a mistake, thus raising the cost for the attacker.

(7) The defender has three tactical options: defense in depth, key sector defense, and mobile defense. Defense in depth suggests an outer and inner defense combination; key sector defense means strongpoint defense of vital positions, mainly those controlling major avenues of approach; and mobile defense is based on counterattack capability. These are not mutually exclusive options.

(8) Urban areas facilitate night exfiltration and movement by small groups.

(9) Preventing the enemy's reentry of cleared buildings is a significant challenge to both the attacker and defender. The requirement to secure cleared areas causes commanders and leaders to dedicate forces specifically to this task.

(10) Mortars may be used more heavily than artillery in urban areas due to their immediate response and high-angle fire capabilities.

(11) The employment of snipers and squad Marksmen in urban combat can prove to be extremely effective for both the attacker and defender.

(12) Ammunition consumption is probably five to ten times greater in an urban environment.

b. **Stability and Support Planning Factors.** The brigade and battalion S2s conduct the IPB process; commanders and leaders must use the information provided to determine the best method to accomplish the mission. Company teams often conduct certain stability and support operations, such as support to insurgency, and counterterrorist operations with special operations forces (SOF). For example, company teams may

conduct supporting missions such as isolating the objective or providing security for the SOF. The following considerations assist in evaluating the threat during stability and support operations.

(1) Population status overlays are prepared for the urban area, showing potential neighborhoods or districts where a hostile population could be encountered. Overlays are also prepared showing insurgent or terrorist safe houses, headquarters, known operating areas, contact points, and weapons supply sources. These overlays must include buildings that are known, or could become, safe houses; and explosives, ammunition, and or weapons storage sites.

(2) Urban operations are three-dimensional. Subterranean routes are of primary concern when considering insurgent and terrorist avenues of approach and lines of communications. Sewers, subways, tunnels, cisterns, and basements provide mobility, concealment, cover, and storage sites for insurgents and terrorists.

(3) Elevated railways, pedestrian overpasses, rooftops, fire escapes, balconies, and access ladders provide mobility and concealment, and can serve as fighting or sniper positions.

(4) Although doctrinal templates are not developed for urban stability and support operations, pattern analysis may reveal how the threat operates, and what its primary targets are. Once the threat's method of operation is determined, insurgent situation maps can be developed. These maps should pinpoint likely targets based on the previous attack history. Electrical power generation and transmission facilities, gas production and holding facilities, water and sewer pumping and treatment plants, telephone exchanges and facilities, and radio and television stations should be considered as primary threat targets when developing these maps

(5) If the threat has become intermingled with the population, a greater degree of control is required for operations. While detection is more difficult, threat forces operating without uniforms share some common characteristics with insurgents or terrorists. ROE become more important to units in this situation.

(6) With operations of this type, intelligence and the careful application of nonlethal and lethal force, play dominant roles. Known members of the armed forces, their auxiliaries, and the underground must be identified and arrested and or removed from the populace. Use of minimum force and adherence to the ROE are critical.

(7) The local population's support to the threat may be either forced or given willingly. In either case, an effort must be made to separate the threat from the local population base. A population can be forced into giving support by a combination of terrorism (either by coercion or intimidation) and harassment. Commanders and leaders must be observant and sensitive to the local population's concerns before expecting the population to help friendly forces.

(8) The threat's logistical support occurs in smaller packages. The threat must rely on the local population to support the distribution of logistics; therefore, the identification and seizure or destruction of threat logistics (less medical materiel) bases are more difficult. To stop threat resupply operations, friendly forces would have to stop all movement within the urban area, which is practical. Therefore, intelligence and operational priorities should be the identification and destruction, neutralization or control of the threat's logistical bases.

(9) Commanders and leaders must be aware of the political and psychological impact of their actions if force is used. Although the local population may be neutral or demonstrate lukewarm support for friendly forces, excessive use of nonlethal or lethal force may cause the local civilians to support the threat. Of special concern is the media (newspapers, television, magazines, and so forth). Due to the large numbers of journalists and amateur and or professional photographers in urban areas, any negative images of friendly forces are probably publicized. Negative publicity could have an adverse effect on both US public opinion and interests. Conversely, positive publicity can greatly enhance friendly operations and morale. This publicity can also sway the local population away from the threat. Therefore, all media members are accompanied. Commanders and leaders must ensure that the ROE are enforced and that noncombatants are treated with dignity.

(10) Ground maneuver units have historically been used as a part of the effort to separate the threat from the local civilian populace. Some units may be detailed to provide civil services such as law enforcement patrols, trash pick-up, and or the restoration and maintenance of power, telephone, and water services. Commanders and staffs should anticipate these missions during transition to stability and support operations.

2-16. THREAT

The types of threats that units may face in an urban area and how they are to fight/operate are discussed in this paragraph.

a. **Conventional Forces.** Many Third World countries have adopted techniques of urban combat from either the United States or the Commonwealth of Independent States (some of the former USSR republics). Therefore, the future threat may consider the motorized or mechanized rifle battalion the most effective unit for urban combat because of its inherent mobility, armor protection, and ability to quickly adapt buildings and other structures for defense.

(1) These types of threat defenses are organized into echelons to provide greater depth and reserves.

(2) Company strongpoints are prepared for perimeter defense and form the basis for the battalion defensive position.

(3) The reserve is located in a separate strongpoint.

(4) Ambush locations are established in the gaps of the strongpoints, and dummy strongpoints are constructed to deceive the attacker.

(5) Positions for securing and defending the entrances to and exits from underground structures and routes are established.

(6) Security positions are prepared forward of first echelon defensive positions.

(7) A motorized or mechanized rifle company may defend several buildings with mutually supporting fires or use a single large building as part of a larger defensive system.

(8) Each platoon defends one or two buildings or defends one or two floors of a single building.

b. **Other Threats.** Different threats in many underdeveloped countries are neither conventional threats nor can they be described as an insurgency.

(1) Some forces may be semi-skilled light Infantry, as might be found in several African countries that have recently undergone civil wars such as the Democratic Republic of the Congo (formerly Zaire). These troops are normally poorly trained, poorly equipped, and poorly motivated. Using the case of the Congo as an example, 40 percent of the populace comes from the cities, which are the locations of most of the recent conflicts. These forces should not be underestimated. They know the terrain and may have the support of the population.

(2) Other types of forces may include personal armies of local warlords, such as those found in Somalia.

(3) Another type of force may include semi-organized groups of thugs, loosely organized under the control of an individual, such as the "Dignity Battalions" in Panama or the situation encountered in Haiti.

(4) Another source of organized force may be the police force or gendarme. In some countries, the gendarme may be a more effective fighting force than the army.

(5) In some instances, the threat may consist of organized criminals or paramilitary forces appearing on the battlefield. They may be actively hostile threats or act as support for other forces.

c. **Unconventional Forces.** These threats consist of urban insurgents and terrorist groups. (See FM 7-98 for detailed descriptions.)

d. **Threat Doctrine.** No single threat doctrine can be identified as the one the US military faces during UO. This does not mean that potential opponents do not have clearly identifiable doctrinal principles or that they have not developed specific TTP for urban combat based on those principles. Commanders and leaders at all levels must strive to identify the TTP an opponent uses and to anticipate his actions.

(1) Many of the world's largest modern armies are devoting an increasing amount of their training to UO. These armies realize that urban operations are unavoidable in future conflicts. Some, but not all, of these armies base their tactics on those developed and used by the former Soviet Union. Others use Western doctrinal principles to guide their development of specific TTP.

(2) The threat US forces may face during combat in urban areas is not limited to just large modern armies, however. Many regional powers and third world countries have developed philosophies that call for urban operations to be the centerpiece of their military policy. They continue to develop doctrinal principles and TTP that may be loosely based on a Western or former Soviet Union model, but are often unique to their specific geography, society, culture, and military capability.

(3) Insurgent groups and warring factions in many places around the world have discovered that the urban area offers many tactical advantages, especially against a modern army such as the US These groups may have some formal military training, or they may develop unique urban combat TTP based on specific characteristics of their beliefs or the personalities of their leaders. (Additional information on operations in this type of environment can be found in FM 7-98 and FM 90-8.)

(4) One threat in urban areas that has become increasingly common, regardless of the opponent, is the sniper. Worldwide, there has been an increase in the amount of military weapons designed to deliver long-range precision fire. Some of these weapons are now very powerful and accurate. The sniper has shown that he can be a dangerous opponent,

one that can sometimes obtain results far out of proportion to the number of personnel committed to sniping. (See Chapter 6 for more information.)

e. **Detailed Description of Threat Tactics.** The increasing availability of sophisticated technology has created unorthodox tactics that can be exploited by potential opponents. These tactics seek to counter the technological and numerical advantages of US joint systems and forces, and to exploit constraints placed on US forces due to cultural bias, media presence, ROE, and distance from the crisis location. Offsetting their inherent weaknesses, enemy forces seek an advantage in urban terrain to remain dispersed and decentralized, adapting their tactics to provide the best success in countering a US response. These threats range from units equipped with small arms, mortars, machine guns, antiarmor weapons, and mines to very capable mechanized and armor forces equipped with current generation equipment. Urban environments also provide many passive dangers such as disease from unsanitary conditions and psychological illnesses. While the active threats vary widely, many techniques are common to all. Figure 2-41 provides a set of tactics available to potential threats opposing US forces in urban areas.

Figure 2-41. Urban threat tactics.

(1) ***Use the Population to an Advantage.*** The populace of a given urban area represents key terrain and the side that manages it best has a distinct advantage. Future urban battles may see large segments of the populace remain in place, as they did in Budapest, Hungary and Grozny, Chechnya. Units involved in urban stability and support operations certainly conduct missions in and among the residents of the area.

(a) Threat forces may use the population to provide camouflage, concealment, and deception for their operations. Guerilla and terrorist elements may look no different than any other members of the community. Even conventional and paramilitary troops may have a “civilian” look. Western military forces adopted the clean-shaven, close-cut hair standard at the end of the nineteenth century to combat disease and infection, but

twenty-first century opponents might very well sport beards as well as civilian-looking clothing and other "nonmilitary" characteristics.

(b) The civil population may also provide cover for threat forces, enhancing their mobility close to friendly positions. Threat forces may take advantage of US moral responsibilities and attempt to make the civil population a burden on the Army's logistical and force protection resources. They may herd refugees into friendly controlled sectors, steal from US-paid local nationals, and hide among civilians during offensive operations.

(c) The civil population may also serve as an important intelligence source for the threat. Local hires serving among US soldiers, civilians with access to base camp perimeters, and refugees moving through friendly controlled sectors may be manipulated by threat forces to provide information on friendly dispositions, readiness, and intent. In addition, threat special purpose forces and hostile intelligence service assets may move among well-placed civilian groups.

(2) ***Win the Information War.*** Threat forces may try to win the information war as much as they may directly oppose friendly operations.

(a) Portable video cameras, Internet access, commercial radios, and cellular telephones are all tools that permit threat forces to tell their story. American "atrocities" may be staged and broadcast. Electronic mail may be transmitted to sympathetic groups to help undermine resolve. Internet web sites provide easy worldwide dissemination of threat propaganda and misinformation. Hackers may gain access to US sites to manipulate information to the threat's advantage.

(b) The threat may make skillful use of the news media. Insurgent campaigns, for example, need not be tactical military successes; they need only make the opposition's campaign appear unpalatable to gain domestic and world support. The media coverage of the Tet Offensive of 1968 affected the will of both the American people and their political leadership. Although the battle for Hue was a tactical victory for the US, the North Vietnamese clearly achieved strategic success by searing the American consciousness with the high costs of urban warfare.

(3) ***Manipulate Key Facilities.*** Threat forces may identify and quickly seize control of critical components of the urban area to help them shape the battle space to their own ends. Telephone exchanges provide simple and reliable communications that can be easily secured with off-the-shelf technologies. Sewage treatment plants and flood control machinery can be used to implement the use of weapons of mass destruction (WMD) or to make sections of the urban area uninhabitable. Media stations significantly improve the information operations position of the controlling force. Power generation and transmission sites provide means to control significant aspects of civilian society over a large area.

(4) ***Use the Three Dimensions of Urban Terrain.*** The threat thinks and operates throughout all dimensions of the urban environment. Upper floors and roofs provide urban threat forces excellent observation points and battle positions above the maximum elevation of many weapons. Shots from upper floors strike friendly armored vehicles in vulnerable points. Basements also provide firing points below many weapons' minimum depressions and strike at weaker armor. Sewers and subways provide covered and concealed access throughout the area of operations. Conventional lateral boundaries are

often not apply as threat forces control some stories of the same building while friendly forces control others.

(5) ***Employ Urban Oriented Weapons.*** Whether they are purpose-built or adapted, many weapons may have more utility in an urban environment while others may have significant disadvantages. Urban threat weapons are much like the nature of urbanization and the urban environment—inventive and varied. Small, man-portable weapons, along with improvised munitions, dominate the urban environment. Figure 2-42 lists examples of threat weapons favored in UO.

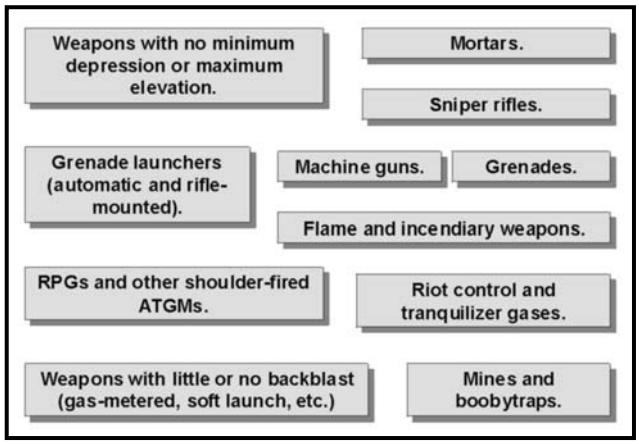


Figure 2-42. Favored threat weapons.

(6) ***Engage the Entire Enemy Force.*** Threat forces may "hug" units operating in an urban area to avoid the effects of high-firepower standoff weapon systems. They may also try to keep all or significant portions of the unit engaged in continuous operations to increase the susceptibility to stress-induced illnesses. UO, by their nature, produce an inordinate amount of combat stress casualties, and continuous operations exacerbate this problem. The threat may maintain a large reserve to lessen the effect on its own forces.

(7) ***Focus Attacks on Service Support and Unprotected Soldiers.*** Threat forces may prey on soldiers poorly trained in basic Infantry skills. Ambushes may focus on these soldiers while they are conducting resupply operations or moving in poorly guarded convoys. UO are characterized by the isolation of small groups and navigational challenges, and the threat may use the separation this creates to inflict maximum casualties even when there is no other direct military benefit from the action. As a result, ground maneuver units may find themselves providing security for logistical units during certain types of UO.

2-17. PROJECTED THREAT CAPABILITIES

The wealth of some nations are used to modernize their armed forces through the acquisition of new technologies. Projected future threat force capabilities are—

- New munitions such as fuel air explosives (FAE), enhanced blast, thermobaric, and other improved ballistic technologies.
- Systems with interchangeable warheads, some designed for urban combat.
- Precision-guided munitions.

- Robotics.
- Day or night target acquisition systems.
- Improved engineering abilities to breach or emplace obstacles.
- Soft-launch hand-held AT and flame weapons.
- Nonlethal incapacitating chemical or biological agents by conventional forces.
- Lethal chemical or biological agents used as an asymmetric threat.
- Improved self-protection (body armor).
- Improved communications.

2-18. MODERN URBAN BATTLE ANALYSIS

"What was needed was for us to act so that every house in which we had even one soldier became a fortress against the enemy. All would be well if every soldier fighting in a basement or under the stairs, knowing the general task facing the army, stood his ground alone and accomplished the task on his own. In street fighting, a soldier is on occasion his own general. He needed to be given correct guidance and so to speak, the trust of the generals."

Marshal Vasili I. Chuikov,
Hero of the Soviet Union and Defender of Stalingrad
Quoted in *The Battle for Stalingrad*

A historical analysis of recent experience in urban combat provides insight into the conduct of the urban fight. While urban combat remains primarily an infantry fight, the importance of maneuver warfare and combined arms in the urban environment cannot be neglected. The following information has been extracted from *Modern Experience in City Combat*, produced for the US Army Human Engineering Laboratory in 1987. It is based upon an analysis of urban combat from World War II, Korea, Vietnam, and the Middle East. (See Appendix H for additional information.)

a. **General.** An attack on urban terrain that is well planned and executed is successful. Such an attack does not have to be casualty or resource intensive. An attacker does not necessarily need a much higher force ratio in urban terrain than in other terrain. The force ratio does, however, have an impact on the duration of combat. Urban combat consumes time that the attacker may ill afford to spend. Urban battles may take two to three times longer than anticipated. Defense in an urban area does not appear to provide a significant advantage to the defender over a defense in other terrain. A well-planned defense in an urban environment can consume the attacker's time (even without combined arms forces or sophisticated weapons), which allows the defender to put other forces to better use or to prepare for other operations. Essentially, the attacker has a favorable situation over the defender during high-intensity combat. The more restrictive the ROE, the more difficult it is for the attacker.

b. **Intelligence.** Most recent urban battles lost by the attacker were lost because of a failure of intelligence. Some of these battles would never have taken place if the initial intelligence were clear.

c. **Surprise.** Surprise can be an important asset. It is a combat multiplier, but not necessarily a decisive one. Tactical surprise can preempt effective defensive preparation.

d. **Combined Arms.** As in other combat, the US Army fights the urban battle as a combined arms battle.

(1) ***Infantry.*** Urban combat is still Infantry intensive. Infantry units can be equipped and trained for urban operations. Infantrymen can negotiate types of urban terrain that no other combat arm can.

(2) ***Armored Vehicles.*** Urban combat is also an armor fight. Tank support of Infantry was a key element in many recent urban battles. Tanks act best as assault guns to reduce strongpoints. The use of armored vehicles has only been effective when they have been protected by Infantry. Lack of Infantry to protect armored forces leads to disaster on restricted urban terrain.

(3) ***Artillery.*** Artillery support can be significant to the outcome if the ROE allow its use. Delay fuzes allow penetration of buildings to cause the most casualties. Artillery rounds can be used with VT fuzes to clear rooftop observation and weapons positions with relatively little collateral damage. However, artillery to provide isolation of an objective and in the direct fire role to reduce strongpoints has been most effective in urban combat. In other than high-intensity conditions, artillery loses much of its ability because of the problems associated with collateral damage.

(4) ***Mortars.*** Mortars are the most effective indirect fire weapon in urban combat. The high angle of fire gives mortars flexibility to clear structures and place fires in streets where artillery cannot. Mortars suffer from the same limitations as artillery in conditions other than high-intensity.

(5) ***Antiaircraft Artillery.*** Antiaircraft artillery proved its worth in many urban battles because of its high rate of fire and destructive potential. Having phased out the Vulcan, the US Army does not have any remaining weapons of this type. Other multinational and coalition forces may have them, and they can be very useful in support.

(6) ***Aviation.*** Aviation assets are relatively ineffective by themselves in urban operations. They have had little impact on the defender's will or his ability to resist. Aviation assets can, however, help isolate an objective. AC-130 and helicopter gunships have much greater accuracy than other aviation assets and can reduce targets without much collateral damage to surrounding structures. These slow-moving assets are susceptible to small arms fire and shoulder-fired antiaircraft missiles.

e. **Time.** Urban battles can take two to three times longer than other battles and usually much longer than anticipated, which results in the expenditure of more logistics. Time may allow the defender to reorganize or redeploy forces elsewhere as he uses his forces in urban areas in economy-of-force missions.

f. **Isolation.** Where the attacker can isolate the defender, the outcome is certain. Even partial isolation provides the conditions for a favorable result for the attacker. Failure to isolate the defender significantly raises the cost of victory. The attacker must stem the uninterrupted flow of manpower, supplies, and weapons to the defender. No single factor appears to be as important as isolating the objective.

g. **Cost.** In the majority of urban battles, the cost to the attacker is high. Several factors affect the cost. Isolation of the urban area is a crucial element to the attacker; the higher the superiority of forces of the attacker, the lower the cost for the attacker. The operation must be carefully planned, and intelligence is critical. Finally, attacking forces

must be trained in the TTP of urban combat. Understanding these considerations leads to lower costs. From the viewpoint of the defender, urban combat can be an economy-of-force operation or can cause attacking forces many casualties. If properly prepared, an urban defense can extract a significant cost from the attacker in men, resources, and time.

h. **Rules of Engagement.** The nature of modern urban combat may seriously restrict the use of weapons. Most recent urban battles have had one or both of the following restrictions imposed upon the attacker:

- To minimize civilian casualties and collateral destruction.
- To limit the use of specific ground or air weapons.

i. **Logistics.** Combat in urban environments may cause a dramatic increase in the demand for certain items and it certainly causes requests for items that have specific uses in urban terrain. High-intensity urban combat requires a continuous flow of ammunition and medical supplies. Commanders should consider the use of a *push* system to deliver supplies to units in urban terrain, based upon the type of operation they are conducting. This technique should include the push of an urban operations *kit* to units entering urban areas.

j. **Combat Health Support.** Although there is no difference in medical treatment (there is a greater reliance on self-aid/buddy aid and combat lifesavers), there are differences for evacuation in urban areas. Medical evacuation (MEDEVAC) in an urban environment presents many challenges in the location, acquisition, and evacuation of patients. Techniques may require modification to acquire and evacuate casualties from above, below, and at ground level. Further, during UO, the environment (rubble and debris) may dictate that evacuation be accomplished by litter carries rather than by vehicle or aircraft. Commanders should be prepared for evacuation from within buildings and for the possibility that air MEDEVAC may not be available due to the fragility of the aircraft and their susceptibility to small arms fire. Treatment facilities may have to be moved much farther forward than usual. Units need specific medical policies, directives, and SOPs for dealing with noncombatants.