US Army Corps of Engineers®

EP 1105-3-1
19 January 2009

PLANNING

BASE CAMP DEVELOPMENT IN THE THEATER OF OPERATIONS

ENGINEER PAMPHLET

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DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

EP 1105-3-1

CEMP-OP

Pamphlet
No. 1105-3-1

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Protecting and enhancing the life, health, safety, and quality of life of the service member is at the heart of the United States Army Corps of Engineers (USACE) military support mission. As a part of that mission, the Corps of Engineers and all members of the engineer family stand ready to provide vital planning, engineering expertise, and other support to the operational Army, military Services, and other federal agencies. In so doing, the Corps provides direct support and benefit to Soldiers and members of other services, as well as allied and coalition nations and citizens of host nations (HNs) wherever there is a dedicated U.S. interest or presence. Base camp development is an example where USACE leadership and expertise have become a recognized and highly valued resource. Our support to combatant commanders (CCDRs) in this area ensures that base camps can act as power projection platforms throughout full spectrum operations while allowing the promulgation of the operational mission intent in a most effective, efficient, and sustainable manner that enables force protection and augmentation of the CCDR's mission assets. As part of our effort in supporting this mission, we have developed this engineering pamphlet (EP) to support base camp development. While this pamphlet can be used by an experienced military planner as a base camp development planning resource, its primary purpose is to provide a more detailed discussion of the topics presented in the USACE Base Camp Development Planning (BCDP) Course. It provides the user an overview of base camp development planning; one of the five considerations and processes that contributes to the overall lifecycle of base camp development (see field manual [FM] 3-34.400). It does not specifically address design, construction, operations (sustainment), or closure/turnover considerations beyond the planning process. While there are many specialties and functions associated with successful base camp planning and development, this pamphlet focuses primarily on the engineer-specific areas of base camp planning. Finally, this EP is not specific to any single functional or geographic combatant command; it provides general planning guidance that the user must analyze, refine, coordinate and, ultimately, adapt to meet the CCDR's guidance and needs.

1. Purpose. This pamphlet fills a fundamental role in meeting this mission requirement and establishes a process for—

- Selecting suitable base camp locations while coordinating with CCDRs, the U.S. Department of State (DOS), the Federal Emergency Management Agency (FEMA), other federal agencies as appropriate, and the HN.

- Planning and documenting the detailed actions needed for a properly located and sized base camp that consider related land areas, facilities, utilities, and other factors to provide service members with the safest, healthiest, and best living and working conditions in the theater of operations (TO).

- Planning and executing the cleanup and closure of a base camp in a manner that meets U.S. and HN standards or those approved by the theater command.

2. Applicability. This pamphlet applies to all Headquarters, USACE (HQUSACE) elements and all USACE commands having responsibility for or a role in supporting the planning, development, or establishment of a base camp as directed by the appropriate authority within the U.S. government.

3. Distribution Statement. Approved for public release; distribution is unlimited.

4. References. Required and related references are at Appendix A.

5. Explanation of Acronyms and Terms. Doctrinal acronyms and special terms used in this pamphlet are explained in the glossary. Many terms used by service members to describe a base camp, however, have not yet been incorporated in the lexicon of current joint and Army doctrine. For this pamphlet, the term base camp may, in some cases, have applicability to some of the following terms: *advanced operations base*, *forward operations base*, *forward operating base*, *main operations base*, *base of operations* (specifically a designated facility), *base*, *facility* (where it applies to contingency support operations), *base complex*, *base development*, *forward logistics base*, *logistics base*, *staging base*, *lodgment area*, *special forces operations base*, *bare base, enemy prisoner of war* (*EPW) facilities*, *fire base*, *contingency operation base*, *contingency operation site*, *contingency operation location*, *main operating base*, *forward operating site*, *cooperative security locations, and convoy support centers*.

I heartily endorse this document. Use it to enhance your knowledge and improve our collective capability to meet this vital mission requirement.

FOR THE COMMANDER:

9 Appendices
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STEPHEN L. HILL
Colonel, Corps of Engineers
Chief of Staff

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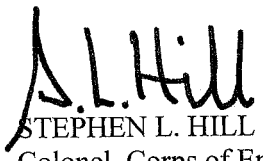
FOR THE COMMANDER:



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CHAPTER 1

Introduction to Base Camps

1-1. The Operational Environment. U.S. military forces conduct operations against, and alongside, state and nonstate participants in all regions of the globe. These operations cover the full spectrum of conflict, from stable peace, through unstable peace, to insurgency and general war (see Figure 1-1 and FM 3-0). Within this spectrum, operational themes may be used to describe the dominant major operation or phase of the campaign within the land force commander's area of operation (AO). Limited intervention, peace operations, irregular warfare, and major combat operations are those themes that are related to insurgencies and general war.

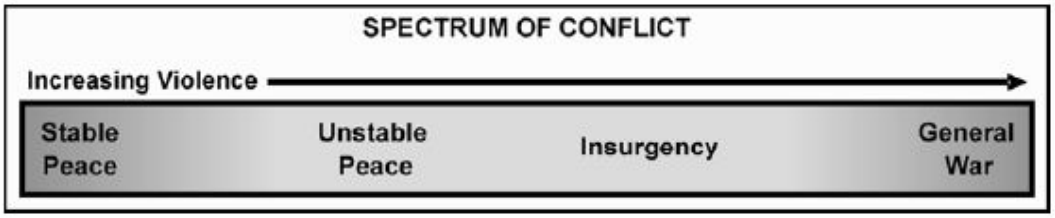

Figure 1-1. The spectrum of conflict

a. The Army's operational concept, as detailed in FM 3-0, is called full spectrum operations. This refers to the Army's ability to combine offensive, defensive, stability, and civil support operations, simultaneously. The first three of these pertain primarily to U.S. military operations in foreign countries. The last, civil support operations, pertains only to support provided to civil authorities, such as disaster relief and border security, conducted within the United States.

b. The Army has long defined offensive and defensive operations. While conducting stability operations has been the predominant mission throughout its existence, the Army has only recently established stability operations as a core Army mission (see FM 3-0). Joint Publication (JP) 3-0 defines *stability operations* as an overarching term encompassing various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. The recognition of stability and civil support operations as core components of the Army mission has greatly impacted how the Army views itself, trains, and conducts operations.

c. In addition to the full recognition of stability and civil support missions, the Army now places greater emphasis on joint operations involving all U.S. military Service branches; multinational operations with allied and coalition forces; and interagency coordination with various U.S. and HN governmental and nongovernmental (NGO) agencies. Cooperation with these entities, along with the expanded role of civilian

contractors, has numerous implications for the planning and conduct of operations. The Army seldom plans and conducts operations strictly with Army assets. It now plans for and integrates all of the applicable components of national power into its missions.

1-2. The United States Army. The U.S. Army is the primary land component of the U.S. Armed Forces. It is a force which continually evolves to meet strategic, operational, tactical, and organizational challenges. The Army's current period of evolution, generally referred to as *Transformation*, has changed the Army from a forward deployed force based largely in Europe and Asia, to a force based primarily within the United States. Organizationally, the Army has transitioned from a division centric to a brigade centric force. This force is more modular than the previous Army structure and enables the Army to better deploy only the specific assets required to conduct and support a given mission. Further developments of lighter and more sustainable equipment are also making the Army faster and better organized and equipped to conduct operations with a smaller logistics footprint. In addition to implications regarding equipment, training, and personnel, *Transformation* has required the Army to adopt an operational mind-set that is expeditionary and campaign focused.

a. *Expeditionary capability* is the ability to promptly deploy combined arms forces worldwide into any operational environment (OE) and operate effectively upon arrival. Expeditionary operations require the ability to deploy quickly with little notice, shape conditions in the operational area, and operate immediately on arrival (see FM 3-0). Expeditions are conducted on short notice and are of generally limited scope and duration. The forces involved are closely tailored to meet the requirements of the expedition in order to reduce the overall support requirements.

b. *Campaign capability* is the ability to sustain operations as long as necessary to conclude operations successfully (see FM 3-0). Campaigns are sustained operations, quite often evolving from expeditions, which may have changing missions and requirements. They require significant commitments of assets and a robust infrastructure to support and sustain them.

c. U.S. forces conducting expeditions and campaigns from forward deployed locations will seldom have the luxury of conducting their missions from established installations. They will most often operate from base camps (the generic term for a variety of types of facilities) with a variety of construction standards and facilities. These camps may be already established in nations adjacent to the operational area, or they may be established once the operation has begun. Depending on the situation, base camps may be planned from the start of the mission but typically evolve over time in response to emerging mission requirements.

1-3. General Overview of Bases. A *base* is a locality from which operations are projected or supported (JP 3-10). Army bases overseas typically fall into two general categories: base camps and permanent bases or installations. A base can contain one or multiple units

from one or more Services. It has a defined perimeter and established access controls, and it takes advantage of natural and man-made features.

a. Base camps. A *base camp* is an evolving military facility that supports the military operations of a deployed unit and provides the necessary support and services for sustained operations. Base camps are typically designed to be used for short- to mid-term periods, generally from a few months to a few years. They have a limited number of fixed facilities constructed and typically have a well-defined perimeter and controlled access. These facilities include various types of housing; sanitation; command and control (C2); morale, welfare, and recreation (MWR); and supporting logistics infrastructure. These facilities may include new or prefabricated construction and make maximum use of any existing structures (with and without repair or modification). They are usually established to support a specific mission or operation for an extended period of time and are closed at the conclusion of that operation. These missions may include offensive, defensive, stability, or civil support. Base camps are subject to a broad range of construction, facility, and environmental standards, depending on the camp's anticipated life span, population, function, governing documents (for example, Central Command Regulation [CCR] 415-5 [the Sand Book] or the Base Camp Facilities Standards for Contingency Operations [the Red Book]), location, and the tactical and political situation.

b. Installations. An *installation* is a permanent location, designed and built for use over the long term (decades). Installation facilities are generally designed and built by civilian contractors according to U.S. construction standards. They are considered to be, and are managed as, real property and are subject to strict and well-established design, construction, management, and environmental regulations. Facilities on installations in foreign countries typically match those found on installations within the United States and are subject to a separate set of published standards. Installations are generally managed, or experience a high degree of oversight, by civilians within Department of Defense (DOD) agencies.

c. Base camps established for several years may evolve into installations. Often, however, there is no clear point when this occurs. At either end of the time line (short-term or long-term) the differences will be fairly clear. In the midterm, however, the quality of life, construction, and environmental standards between base camps and installations may experience significant overlap.

d. Base camp planners assist in the location, design, construction, and cleanup and closure of base camps that support military forces or government organizations across the spectrum of conflict. The BCDP process involves the integration of base camp types, functions, allowances, and construction standards with the commander's (customer's) requirements, resources, and available terrain. As such, base camps are not easily defined entities. They are developed to meet various (sometimes competing) requirements, come in all shapes and sizes, and integrate many similar characteristics. Above all, a base camp is a physical location that provides forces (military or otherwise) with a secure, functional

location from which to conduct and sustain operations while providing an adequate quality of life for its occupants.

1-4. History of Base Camps. Military forces have used base camps in various forms throughout history. They were used for essentially the same purposes that they are today—as temporary and secure locations to conduct and support operations. As with today, they sometimes evolved into permanent installations that affected the local political and economic situation on a long-term basis.

a. The Roman Legions established base camps that provided fortified locations from which to support operations or to fall back on in emergencies. Scouts moved ahead of the line of march to locate defensible locations with access to adequate food and water supplies and transportation networks. These camps enabled the Roman forces to establish secure bases to operate from, influence and control the local populations, conduct nation building, and secure their lines of communication (LOC). In some cases the locations of these camps were ultimately transformed into cities. The remains of other camps can still be found today.

b. Throughout its history, the U.S. military has employed base camps in support of operations. The Civil War saw a rise in the specialization of camps developed to meet specific missions. Some camps were established for support operations, while others were established specifically for combat operations. States established camps of instruction where new recruits were equipped and received their initial training before joining the forces that were engaged in active operations. Other camps were established primarily as logistics bases to store supplies and forward them on to the armies in the field. These armies would often establish temporary camps in support of their current operations or winter camps where they would rest and train until the opening of the campaign season in the spring. Other small camps and earthwork forts were established to secure key terrain and LOC against enemy raids and insurgent groups. The standards at all of these camps varied, depending on the length of the mission, the type of forces deployed, the level of threat, and other aspects of the tactical situation.

c. On the frontier, the U.S. Army was faced with policing, protecting, and exploring a large geographic area with limited personnel and resources. Permanent installations, generally referred to as forts, were located at key locations such as harbors, river crossing, and road networks. These installations often included buildings constructed of brick and stone, well-developed fortifications, and housing for Soldiers and their families. From these installations, a network of smaller camps and depots was established where small detachments of personnel could secure LOC, conduct patrols, and provide a "presence" to reassure the local populations. A variety of local materials was used in their construction, and quality of life for the Soldiers using them was diverse.

d. During the Vietnam War, base camps became the focal point of operations and not just a means of supporting the troops in the field. While continuing to perform their historic support function, base camps were essential for providing security for local

populations. They were used as air bases for helicopter operations, patrol bases for forces operating against the enemy, and fire support bases for artillery support. These camps varied in size from the main division bases and airfields, often constructed with HN and contractor assistance, to the smaller fire support and patrol bases that were constructed by military personnel.

e. U.S. forces are presently deployed in base camps throughout the world. As with camps throughout history, they vary in size and in quality of life based on the situation. The OE has, however, made some changes in the appearance and operation of these base camps. Compared to the camps of the past, they frequently have an improved quality of life and are often subject to more stringent construction and environmental standards. They also have a greater DOD civilian and civilian contractor presence.

1-5. Types, Functions, and Construction Standards of Base Camps. Base camps are established to support a variety of missions across the full spectrums of conflict and operations. Base camps are broadly defined by type and function, with facilities and standards (construction, quality of life, and environmental) based on the camp's anticipated life span and population. The type of base camp provides a general idea of its purpose and location in relation to the operation that it supports. The base camp's function more narrowly defines its purpose and provides a better idea of the types of facilities required in order to be effective. The anticipated life span further delineates the base camp and helps to define the required standards and allowances.

a. Regardless of the type or function of base camp, the basic BCDP process and sound engineering and master planning principles remain the same. As with any engineer product, the end product is a reflection of the customer's requirements, the "on the ground" reality, and resource constraints. Ultimately, it is the responsibility of the CCDR to determine the exact construction type based on locations, materials available, and other factors to include specified standards (see FM 3-34, FM 3-34.400, and JP 3-34). The final product, in terms of facilities and standards, is driven by the following five areas:

- Type and function of the camp.
- Anticipated base camp population (initially and follow-on occupation if known).
- Anticipated camp life span.
- Standards used (Red Book, Sand Book, and others).
- Other command guidance (operation orders [OPORDs], operation plans [OPLANs], and other directives). Security considerations will always be integrated into planning guidance.

b. Types of base camps. Base camps consist of intermediate staging bases (ISBs) and forward operating bases (FOBs) (FM 3-0). These are the two most common types of base camps in support of military operations, but they are not the only possible variants of base camps.

(1) An *intermediate staging base* is a tailorable, temporary location for staging forces and sustainment and extraction into or out of an operational area (JP 3-34). An ISB is located close to the AO but out of the range of most enemy fires and political influence. It allows forces to deploy, prepare, and train for operations. It is typically located near developed airports, seaports, and/or other transportation facilities to allow forces to deploy and redeploy with their equipment. It requires sufficient space for force beddown to include surge capacity to handle rotating forces, equipment staging, and necessary training areas. As with other bases, standards and allowances are determined by the anticipated camp life span and population. These may include standards for personnel assigned as long-term camp residents and separate standards for personnel who are rotating through the base.

(2) Another type of base camp, a *forward operating base,* is an area used to support tactical operations without establishing full support facilities (FM 3-0). While FOBs range from small outposts to complex, large structures encompassing joint, interagency, and multinational forces, they are primarily end users in the supply chain, oriented upon the mission rather than sustainment. They are established to extend C2 or communications, or provide local support for training and tactical operations. Commanders may establish a FOB for temporary or longer operations. The FOB may include an airfield or unimproved airstrip, an anchorage, or a pier along with other logistics support infrastructure.

c. Functions of base camps. Base camps may be developed for a specific function or may serve several functions. These functions determine what types of facilities are required to support operations. While an ISB, by definition, has a specific function to perform, FOBs may be developed for different purposes. A FOB may operate as a multifunctional main operations base, a primarily tactical base, a logistics base, or in support of training or civil-military operations. FOBs may also be established to support humanitarian assistance and civil support missions. These base camp functions are not specifically defined by doctrine, but do serve as a general guide to determine base camp location and facility requirements. This section provides an overview of some of the key characteristics of base camps that perform specific functions.

(1) *Intermediate staging base*. An ISB functions as a location where military forces can stage into and out of the operational area. While generally similar to an FOB, it includes the specific requirement to be able to handle the deployment and redeployment of significant numbers of personnel and equipment, often over repeated rotations during a period of several years. An ISB may serve as a “warm” base, where the infrastructure has been developed to support possible contingency operations in a specific theater of operations. A “warm” base generally has the capacity to support a large influx of personnel and equipment and may have equipment and vehicles stored on location to support operations and training. There will often be a small military and civilian force on-site to maintain the base and the equipment until needed.

(a) Size: Varies with the anticipated requirement, but may include the capacity for up to several thousand personnel on-site at any given time.

(b) Location:

- Near the anticipated area of operations, but outside of the range of most enemy fires and political influence.
- Close to airports and seaports (depending on the anticipated means of deploying forces into theater).
- Close to road and rail networks to allow the rapid flow of personnel and equipment.

(c) Base facilities:

- Housing. Adequate for the anticipated number of personnel (to include surge requirements), generally consisting of buildings or modular/container units for personnel assigned to the camp and tents for rotating personnel.
- Sanitation. Porta-johns up to a central sewer, depending on the camp location and life span.
- Power. Usually provided by large on-site commercial generators or one or more of the other Services' prime power units such as the Army 249th Prime Power Battalion. In some cases, bases may use a central power plant or the existing civilian electric grid.
- Fuel. Possibly extensive fuel support systems to include military- and civilian-operated fuel bladders and below and aboveground fuel storage tanks.
- Water. Bulk water distribution, possibly including reverse osmosis water purification units (ROWPU) or drilled wells.
- Aviation. Generally helicopter landing pads up to operational airfields, depending on ISB location.
- Logistics. May include extensive warehousing and long-term, climate-controlled vehicle storage and maintenance sites. Will generally have the capacity to assist with sustaining military operations in the AO.

(d) Service member services:

- Medical. May include up to combat support hospitals with dental care. May include a smaller medical clinic for personnel assigned to a “warm” base with the ability to support rotational personnel.
- MWR. Depending on the length of time personnel may occupy the base, may include up to theater facilities, post exchange (PX), internet cafés, long distance phone service, ball fields, gyms, and organized recreation events.
- Other services. Finance, legal, and postal services and education or learning centers may be available, based on the size and life span of the camp. Bath and laundry services may include both military and civilian (tents, trailers, or

new construction). Dining facilities (DFACs) will generally be operated by contractors; however, military food service personnel may be required initially.

(2) *Forward operating base (main operations base).* A FOB functioning as a main operations base will have a robust infrastructure to support a wide variety of missions. It provides a base from which tactical forces can conduct and sustain operations. It will generally include extensive service member support facilities and services and will often include aviation facilities. In some circumstances, military training, civil affairs missions, and even the capacity to support civilian political functions and NGO activities may be included. Close coordination with the customer is *essential* to determine necessary requirements and standards.

(a) Size: Varies with the anticipated requirement, but may include the capacity for up to several thousand personnel on-site at any given time.

(b) Location:

- Adequate available land area, often with existing structures that can be integrated into the camp.
- Close to, or including, aviation facilities.
- Close to, or including, seaport facilities.
- Close to road and rail networks to allow the rapid flow of personnel and equipment.
- May be based on the tactical situation; however, the ability to support and sustain operations will probably be more important than tactical requirements.

(c) Base facilities:

- Housing. Adequate for the anticipated number of personnel (to include surge requirements), up to and including new construction of buildings (based on camp life span).
- Sanitation. Porta-johns up to central sewer (and possibly portable sewer treatment plants), depending on the camp location and life span.
- Power. Usually provided by large on-site generators (commercial, Army prime power, or other Service power units), but some bases in developed countries may use a central power plant or the existing civilian electric grid.
- Fuel. Possibly extensive fuel support systems to include military- and civilian-operated fuel bladders and below and aboveground fuel storage tanks
- Water. Bulk water distribution, possibly including ROWPUs or drilled wells.
- Aviation. Generally helicopter landing pads up to operational airfields, depending on location.
- Logistics. Includes extensive warehousing and material handling capability. Must have the capacity to sustain military operations in the AO.

(d) Service member services:

- Medical. May include up to combat support hospitals with dental care.
- MWR. Depending on the length of time personnel may occupy the base, may include up to theater facilities, PX, internet cafés, long distance phone service, ball fields, gyms, and organized recreation events.
- Other services. Finance, legal, and postal services may be available, based on the size and life span of the camp. Bath and laundry services will generally include military and/or civilian assets (tents, trailers, and possibly new construction). DFACs will generally be operated by contractors; however, military food service personnel may be required initially.

(3) *Forward operating base (tactical base).* A FOB may operate primarily as a base from which tactical operations are conducted. It provides a secure location and will generally have only enough logistics capacity to support the force occupying the camp. There is a great degree of variability based on the size, duration, and tactical situation.

(a) Size: Highly variable based on the size of the force, but will generally be from company (100) to brigade strength (3,000 to 5,000 with reinforcement and additional sustainment assets).

(b) Location:

- Based primarily on the tactical situation (with respect to the mission requirements as well as the ability to defend the base).
- Ability to sustain operations is a secondary (but still important) consideration.

(c) Base facilities:

- Housing. Adequate for the anticipated number of personnel (to include limited surge requirements), generally consisting of tents and the use of existing structures but may include prefabricated housing (trailers) and limited new construction.
- Sanitation. Generally burn out latrines and porta-johns, but possibly sewer lagoons or portable sewer treatment plants.
- Power. Tactical generators up to large on-site generators (commercial or Army prime power).
- Fuel. Organic unit fuel trucks and possibly military (and perhaps civilian contractor) bulk fuel bladders.
- Water. Unit water trailers and bottled water. ROWPUs or drilled wells may be located on some sites.
- Aviation. Generally helicopter landing pads up to operational airfields, depending on location.
- Logistics. Generally limited to sustaining military operations in the unit's AO, but may include some more extensive facilities.

(d) Service member services:

- Medical. Usually limited to organic unit assets, but may include up to combat support hospitals on larger bases.
- MWR. Somewhat limited, but may include up to internet cafés, phone service, and PX trailers (depending on camp size and location).
- Other services. Finance, postal, and legal services are usually limited to organic unit provided assets. Bath and shower facilities may be very limited. DFACs may be operated by contractors on larger bases; however, military food service personnel and meals, ready to eat may be used exclusively.

(4) *Forward operating base (logistics base).* A FOB may be developed primarily to support logistics operations. These bases may be established at airfields, ports, adjacent to highway networks, or along supply routes where they function as convoy support centers, providing sustainment support to military and civilian convoys supporting military forces. While still requiring tactical forces survivability measures for camp security, the base's primary purpose is to provide logistics support. As with any other base, the size and life span, as well as function, will determine facility requirements and standards.

(a) Size: Highly variable based on the size of the force, but will generally be from a few hundred to a few thousand.

(b) Location:

- Near road, rail, airport, and/or seaport facilities. Typically on a main supply route (MSR).
- Tactical considerations are a secondary (but still important) consideration.

(c) Base facilities:

- Housing. Adequate for the anticipated number of personnel (to include surge requirements), generally consisting of tents and the use of existing structures but may include prefabricated housing (trailers) and limited new construction.
- Sanitation. Generally porta-johns, but possibly sewer lagoons or portable sewer treatment plants.
- Power. Tactical generators up to large on-site generators (commercial or Army prime power).
- Fuel. Unit fuel trucks and military (and perhaps civilian contractor) bulk fuel bladders.
- Water. Bulk water distribution, possibly including ROWPUs or drilled wells.
- Aviation. Generally helicopter landing pads up to operational airfields, depending on location and mission profile of the using unit.
- Logistics. Extensive warehousing and material handling capability.

(d) Service member services:

- Medical. Organic unit assets up to combat support hospitals.
- MWR. May include up to internet cafés, phone service, PX trailers (depending on camp size and location), gyms, and ball fields.
- Other services. Finance, legal, and postal services may be available, based on the size and life span of the camp. Bath and laundry services will generally include military and/or civilian assets (tents, trailers, and possibly new construction). DFACs will generally be operated by contractors; however, military food service personnel may be required initially.

(5) *Forward operating base (training base).* In certain circumstances, a FOB may be established to support the training of U.S., allied, coalition, and HN personnel. These bases will have the same requirements as other FOBs of comparable size and life span. In addition, training areas, classrooms, weapons ranges, and separate housing units (with potentially different standards) for students and instructors will be required.

(6) *Forward operating base (civil affairs operations).* Occasionally, the situation may require that separate camps be established to support civil-military missions. These missions may include humanitarian assistance, nation building, and civil support (within the United States). Bases developed for civil affairs missions or support may have specific needs such as allowing relatively easy access to the base by HN civilians and housing and support facilities for government and HN civilians and NGO personnel. A high degree of compartmentalization within the camp may also be required, with separate facilities for military and civilian personnel. Civil support missions conducted within the United States, such as FEMA villages, may also require a more stringent application of construction and environmental standards than those required in foreign countries.

(7) *Internment/resettlement (I/R) facilities*. There are often requirements to construct camps for use as I/R facilities. Internment camps are designed to hold hostile, or potentially hostile, enemy combatants or civilians. Resettlement camps are created to hold civilians that have been displaced, either by war or natural disasters. FMs 3-19.40 and 3-34.400 provide additional guidance and sample plans.

(a) Internment camps. Certain camps are designed to hold enemy combatants. These individuals may be held for varying lengths of time, from a few hours for interrogation up to months or even years. As with any base camp, the facility standards will vary according to the camp's size and life span. As an internment camp, there are certain unique requirements that must be considered. These requirements may include—

- Highly compartmented housing areas to allow for detainee segregation.
- Separate areas for personnel administration, interrogation, in-processing, and possibly trial services.
- Separate areas for military personnel and contractor housing.

- Additional force protection measures to ensure that detainees and military personnel are kept separate and secure.
- Additional food service, religious, and other cultural facilities to support the detainees.

(b) Resettlement camps. In situations where war or natural disasters have impacted the civilian population, resettlement camps are often required. These camps have the potential to be quite large and may hold personnel for extended periods of time. While the threat level and the corresponding need for security measures may be low, resettlement camps still present a number of challenges and various considerations for planners. Some of these include—

- Housing areas that accommodate separate families and families with children.
- Facilities for the elderly.
- Substantial medical facilities.
- Separate areas for civilians and military personnel.
- Relatively easy access for the civilian population, while still implementing adequate security measures.
- Space for NGOs to operate.
- Provisions for separating groups that are potentially hostile to each other.
- Areas dedicated for aid distribution.

d. Base camp standards. Construction and facility allowances and standards are based on the camp's anticipated life span, population, theater standards and, ultimately, customer requirements. JP 3-34 establishes the basic guidelines for allowable facilities and construction standards based on anticipated camp life span. Other sources, such as the Base Camp Facilities Standards for Contingency Operations, the Red Book for the United States European Command and CCR 415-1, the Sand Book for the United States Central Command (USCENTCOM), provide additional guidance which takes into account theater requirements. JP 3-34 establishes two phases for base camp construction and use—*contingency* for camps in operation less than two years and *enduring* for camps in use for more than two years. Within these phases there are five sets of construction standards that guide planners in the selection of allowable facility standards. These five standards include—organic, initial, temporary semipermanent, and permanent. The temporary standard bridges the gap between the contingency and enduring phases. In some circumstances, standards may evolve as the anticipated life span of the camp changes. This often happens when the mission duration is unclear. A camp which begins using organic construction standards may evolve into one with temporary or higher standards. When the mission duration is clear, planners may opt to design the camp based on the standard that matches the anticipated life span. If the camp is going to be in operation for more than two years, construction may begin using temporary or semipermanent design standards.

(1) *Contingency phase*. Base camps developed in the contingency phase are based on three standards—organic, initial, and temporary, with the temporary standard bridging

the gap to the enduring phase. Contingency phase construction is characterized by generally austere living conditions and the use of organic unit equipment and military engineer (rather than civilian contractor) construction (see JP 3-34).

(a) Organic. Organic construction is typical of what would be found in a tactical assembly area. Organic standard construction is set up on an expedient basis with no external engineer support, using unit organic equipment and systems or HN resources. Intended for use up to 90 days, it may be used for up to six months.

(b) Initial. Characterized by minimum facilities that require minimal engineer effort and simplified material transport and availability, initial standard construction is intended for immediate use by units upon arrival in theater for up to six months. The primary difference between organic and initial standards is the application of engineer effort to improve living conditions above what the unit is able to accomplish on its own.

(c) Temporary. Characterized by somewhat minimal facilities, temporary standard construction is intended to increase efficiency of operations for use extending to 24 months, but may fulfill enduring phase standards and extend to 5 years. It provides for sustained operations and may replace initial standard in some cases where mission requirements dictate and require replacement during the course of extended operations. It requires extensive engineer support and may involve new construction, rather than limiting operations to tents and existing facilities.

(2) *Enduring phase*. Enduring phase standards provide for a much improved quality of life and facility efficiency over the contingency phase standards. Typically, the enduring phase includes new construction by both military and civilian contractors, as well as improved service member services and higher construction and environmental standards. DOD construction agents (USACE, the Naval Facilities Engineering Command [NAVFAC], or other such DOD approved activity) are the principal organizations to design, award, and manage construction contracts in support of enduring facilities. (See JP 3-34 for additional information.)

(a) Semipermanent. Semipermanent camps are designed and constructed with finishes, materials, and systems selected for moderate energy efficiency, maintenance, and life-cycle cost. Semipermanent standard construction has a life expectancy of more than two, but less than ten, years. The types of structures used will depend on duration. This standard may be used initially, if directed by the CCDR, after carefully considering the political situation, cost, quality of life, and other criteria.

(b) Permanent. Permanent structures are designed and constructed with finishes, materials, and systems selected for high energy efficiency and low maintenance and life-cycle costs. Permanent standard construction has a life expectancy of more than ten years. Construction standards should also consider the final disposition and use of facilities and any long-term goals for these facilities to support HN reconstruction. Congress and the CCDR must specifically approve permanent construction.

e. Other construction standard considerations. The selection of specific construction standards is based on more than just the anticipated life span of the camp. When selecting standards, planners take into account the commander's guidance, available materials and labor resources, cost, and the tactical situation. If available, for instance, it may be more efficient to use expeditionary base camp sets, such as the Army's Force Provider, rather than organic unit tents. If wood construction Southeast Asia huts (SEAHUTS) are approved for temporary construction, it may be more efficient and effective (based on resources, local climate and insects, and the local labor market) to use concrete masonry unit construction instead. Planners must balance established standards with good engineer judgment to obtain the best results.

1-6. Operational Challenges Associated with Base Camps. The planning and construction of base camps present a number of challenges. As with any engineering or construction project, there are time and resource constraints, laws and regulations, customer coordination issues, and unclear/evolving missions. Some of the primary challenges associated with base camps are theater entry conditions, mission duration, access to resources, and competing requirements and visions.

a. Theater entry conditions. U.S. forces may enter a TO under permissive, semipermissive or forced-entry conditions. These conditions refer to the relative level of support that the governments or populations of the region will provide to U.S. forces. The level of support or hostility that U.S. forces will encounter will have a significant effect on base camp planning and construction.

(1) *Permissive entry*. In a permissive entry environment, U.S. forces are operating with the support of the HN government(s) and can expect support from the majority of the population. This situation makes base camp development much easier by allowing for reduced tactical considerations, easier and more reliable access to resources, and assistance from the local population in obtaining construction materials and contract labor, including skilled labor assets. It also makes planning for base camps easier and allows for the early reconnaissance of potential base camp locations.

(2) *Semipermissive entry*. A semipermissive environment presents greater challenges. In this environment, U.S. forces may be invited into the nation or region by the HN government(s); however, not all factions within the government or within the local population will be supportive. This may dictate lower than desired facility standards to avoid aggravating hostile factions. These situations may impede access to resources and contract labor, will require greater security measures, and will limit the ability of U.S. forces to conduct early reconnaissance of potential base camp locations. These locations may also be driven, at least initially, by tactical rather than sustainment concerns. Humanitarian assistance and civil support missions in response to natural disasters also closely approximate a semipermissive environment. In these situations, the damage caused by the disaster will have many of the same effects: limiting access to resources, complicating transportation, and limiting initial reconnaissance.

(3) *Forced entry*. Forced entry requires U.S. forces to conduct offensive operations to gain a foothold or lodgment in a foreign country. These situations are very difficult to plan for as access to potential base camp locations will be limited. A hostile government or population will limit access to resources, both quantity and types available, and initial base camp locations will be based on the tactical situation.

b. Mission duration. The length of the mission greatly impacts facility and standards requirements. Short duration missions generally require fewer resources and have lower standards, while longer missions require greater commitments. The most difficult missions to plan for are those with an uncertain duration. Planners are forced to anticipate requirements, and often completed work must be redone as the situation changes.

c. Access to resources. Access to resources, whether the ability to move them into the theater or the availability within theater, impacts the planning and design of base camps. In countries or regions with a well-developed infrastructure, materials and skilled labor may be readily available, either by the relatively easy means of transporting them into the area or through using local resources. If the infrastructure is poor or if the tactical and political situations are not favorable (as in semipermissive and forced-entry situations), resources will be harder to obtain.

d. Types of resources available. The relative abundance of certain types of construction materials and the local labor market may also drive some base camp planning and design decisions. The ability to obtain certain construction materials, such as concrete rather then wood products, and the ability of the local labor force to work with those materials, may dictate how camps are constructed. Other civilian trades, such as the availability of skilled electricians and plumbers, will also impact designs and construction management decisions.

e. Competing requirements and visions. While the customer is usually the final decision authority, base camp planners must reconcile allowances (based on theater guidance and established practices) with customer requirements and desires. The customer may be the initial occupying unit or it may be the CCDR, the component commander, or another element that is directing the construction of the base camp. In fact, one of the initial challenges associated with base camp planning is obtaining an estimate of the force structure that will be using the base camp. The force structure will often change during planning and construction and will almost certainly change over the base camp life span. Base camp planning balances the needs of the customer with the reality on the ground, resource availability, and established standards. Often the customer’s immediate needs, such as survivability requirements, compete with other long-term needs. In long-duration missions, the changing environment and changes in customers will require that planners adapt base camps designs to meet these changing requirements.

f. Mitigation of uncertainty. Planners and engineers desire elegant solutions, especially "right-sized" facilities and infrastructure. As soon as buried infrastructure is

deemed feasible for the camp, the uncertainties inherent in all these challenges are best met by installing deliberately oversized utility runs for the greatest flexibility in evolving camp operations and use. "Right-sized" utility infrastructure can quickly become a false economy as it may require the user to not only pay to dig up the same dirt twice, but also can disrupt camp operations while doing so. Aside from getting the right amount of land in the right location, utility infrastructure can be the tightest physical chokepoint through which camp operational surges must pass. By maximizing utility capacity/diameter, only the loads on, and the length of, the system(s) change over the camp lifecycle.

CHAPTER 2

The Base Camp Development Planning Process

2-1. Introduction. The BCDP process describes the method by which base camps are located, designed, constructed, and eventually closed. The process, though generally linear, is not an absolute. There are many variables, such as tactical and political restrictions, as well as engineering, resource, and funding constraints that impact the process. Some of the steps listed in the process may, or must, also occur concurrent with other steps. The BCDP process is evolutionary and is not a lock-step process. It requires constant revision and coordination. *Base camp development planning* is a time-sensitive, mission-driven, cyclical planning process that determines and documents the physical layout of properly located, sized, and interrelated land areas, facilities, utilities, and other factors to achieve maximum mission effectiveness, maintainability, and expansion capability in theater. This chapter describes the general steps that base camp planners follow in the BCDP. Further chapters will discuss some steps in greater detail.

2-2. Description of the Base Camp Development Planning Process. The BCDP process consists of several, not always linear, steps. This process relates to the master planning and military decision-making processes that are further discussed in Chapter 3. The final product is a completed base camp plan that provides a logical and documented solution for a base camp location, land usage, and facilities that will support the needs of the customer and mission accomplishment. As shown in Figure 2-1, page 2-2, the steps are—

- Initiate preliminary planning.
- Location selection.
- Land use planning.
- Facility requirements development.
- General site planning.
- Design guide, programming, and construction.
- Maintain and update plans.
- Cleanup, closure, and archive.

a. Depending on the circumstances, not every step may be necessary for planners to evaluate or execute. Oftentimes, the customer or the HN will have selected or will dictate the base camp location. In other cases, planners may be asked to provide support to the process, and the process may already be under development. In this instance, a base camp has typically been located, a land use plan developed, and the facilities requirements determined by military forces on the ground. The planner may be asked to support only the general site planning, provide designs for new construction, or provide guidance on typical of the environment where base camp planners operate. Regardless of the step in which planners enter into the process, a working knowledge of the BCDP process is necessary to enable them to provide the best possible guidance and, ultimately, a product that best supports the customers needs.

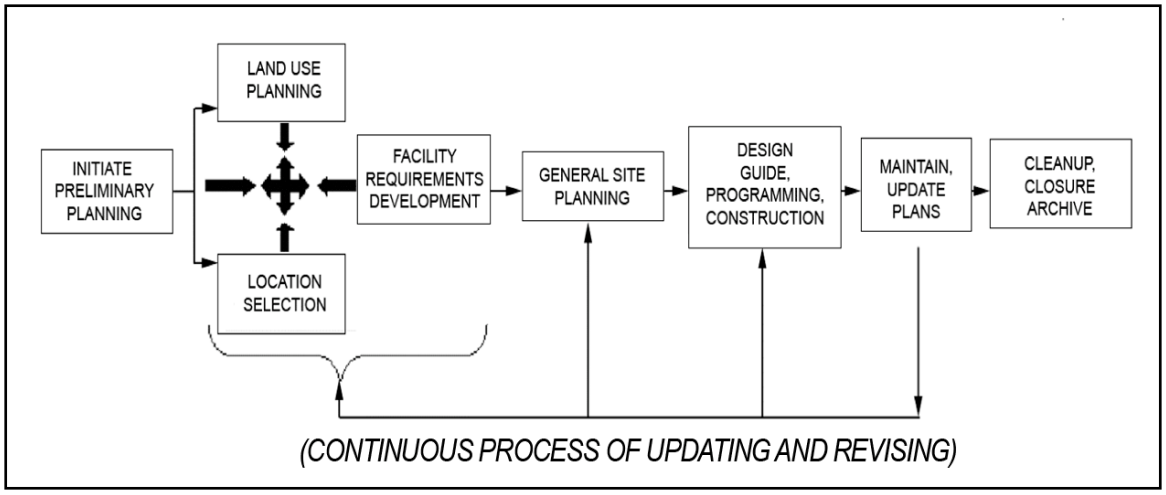

Figure 2-1. The base camp development planning process

b. It probably will be necessary to consider some steps in the process concurrently with others. In time constrained situations, or situations where base camp planners are involved after construction has already started, design and construction of certain aspects of the base camp may be required before completion of the full BCDP process. For example, once identified, survivability measures may be designed and construction initiated before completing the general site plan or even before completing the entire land use plan. This is not the preferred method, but it is a reality that will happen due to mission and funding requirements. Planners should advise commanders that executing construction before completing a plan can lead to less than optimal base camp master plans, increased costs, and potentially increase the time required to complete the base camp. In any case, programming funds for construction needs to begin as soon as it is feasible to ensure proper resourcing. Where possible, base camp cleanup and closure should be integrated early into the planning process. Early integration of cleanup and closure activities, such as planning ahead for how sanitation facilities will be closed out, can avoid or reduce future challenges. The following steps make up the BCDP process:

(1) *Initiate preliminary planning*. Early and thorough planning is essential for any endeavor. Base camps must integrate competing requirements effectively in order to operate efficiently. Initiating preliminary planning is essentially completing a mission analysis—gathering the available information and determining what additional information is required. As noted above, base camp planners may enter the process at this initial step or somewhere further along the process. Performing a mission analysis, whether completed by the base camp planner or by forces already on the ground, is the vital first step. Mission analysis is where the planners answer basic questions and develop requests for information (RFIs) about the project. Mission analysis is also the corresponding first step in the military decision-making process (MDMP). This step is essential to understanding the environment, both physical and operational, in which the camp will operate. Chapter 4 covers mission analysis in relation to base camp planning in greater detail.

(2) *Location selection*. Finding the best possible location for the base camp requires balancing tactical and operational requirements and the ability to sustain the camp with terrain factors such as urban or rural areas, drainage, soils, vegetation, and topography. In some cases base camps may be located on existing facilities. In other cases they may be located on undeveloped land. In either case, it requires a careful balancing of requirements to obtain the best location that meets operational, sustainability, and engineering requirements (see Chapter 5).

(3) *Land use planning*. Although land use planning begins in the early stages of the BCDP, it requires the planner to conduct a facility requirements analysis before it can be finalized. Additionally, since land use can be impacted by the site selected, the planner should confirm that the location selected is adequate and has been approved for the base camp. This step in the process integrates the military units' requirements (such as survivability measures, housing, motor pools, and storage areas) with land use affinities and terrain restrictions. It provides a general overlay of land use areas within the proposed base camp (see Chapter 6).

(4) *Facility requirements development*. Facility requirements reflect the integration of facility allowances with unit requirements. Allowances are based on the type of unit, its size, and the anticipated life span of the base camp. These allowances are found in the theater-specific guidance documents such as the Sand Book and include areas such as square feet of housing space, square feet of command space, and allowances for specific facilities such as chapels and movie theaters. JP 3-34 provides guidance related to facility standards. Once allowances have been determined, they are reconciled with specific unit requirements by validating or adjusting those requirements based upon specific unit needs. For example, the Sand Book may specify a certain amount of square feet for vehicle parking. Coordination with the unit, however, may reveal that they have specific requirements, such as turning pads for armored vehicles. In addition, the theater guidance documents do not take into account every unit requirement. Coordination with the unit may reveal, for instance, that they have water purification units with specific needs. Planners must work with the customer to reconcile what is allowed versus what is required (see Chapter 7). Adjustments to these allowances must be justified.

(5) *General site planning*. Once preliminary site planning has been completed, general site planning further refines the product. General site planning takes the initial land use plan, facility requirements, and coordination with customer requirements, and completes the base camp design. It includes individual building layouts shown within the preidentified land uses. In this step, final decisions with regard to facility types, standards, construction, and the final location of specific structures and facilities are made (see Chapter 9).

(6) *Design guide, programming, and construction*. The design, programming, and construction of base camps begin as early as possible in the BCDP process. This early start is essential to ensuring that funding and resources are available and that the camp is completed in time to conduct its mission.

(a) Design. In most instances, it is necessary to design facilities for base camp use. Although the design effort for some structures, such as vehicle parking areas, will be minimal, others may require significant design effort. Beginning the design process early is essential in order to determine facility types and required resources and make recommendations on labor sources. Planners must balance quality of life, resources, and funding constraints to determine the most efficient and cost effective designs. Depending on the allowable standards, some facilities, such as facilities for housing and recreation, aviation, sanitation, electrical distribution, and survivability measures, may require significant design efforts. When facility allowances provide for new construction to accommodate troop housing, for example, there may be several design options available (tents, prefabricated trailers, SEAHUTs, or concrete/masonry construction). Selecting designs early is critical to ensure adequate and timely resource availability. Where possible, use suitable existing structures, established designs (such as those found in the Theater Construction Management System [TCMS]), and prefabricated buildings. When new construction is required, use established techniques, methods, and materials to simplify planning, material, and labor requirements. The selected design determines, and is also influenced by, resource requirements and availability. As such, planners must select designs which can be supported by available construction materials and other resources. The availability of materials will depend on the local market, access to other markets (which may be determined by the military and political situation), transportation assets, and available funding; for example, it may not be practical to design toilet facilities with flush toilets if the resources (to include water) are not available. The selection of a particular design also impacts, and is driven by, labor availability. The labor for base camp construction may be supplied by military forces, contractors, or HN workers. Each labor source has certain strengths and weaknesses based on equipment, training, and experience. If certain labor assets are available, such as HN workers, it may be beneficial to select designs that meet the local labor skills. Conversely, certain designs may not be supportable based on the available labor pool. Designing wood frame structures for use in a desert environment may not be the best choice if the local labor pool is not familiar with it. They may, however, be skilled in masonry construction. Considering the anticipated labor availability is an important part of the design process.

(b) Programming. Programming for funds must be completed as soon as possible to ensure adequate support. This is especially important if construction will involve the use of contractors or HN personnel, lease payments are required, or restoration and/or damage payments are anticipated. In some circumstances, certain funds may only be used for specific purposes. Consult with contracting representatives to determine fund availability, restrictions on use, and information on how to obtaining funds and arrange for payment to vendors. The contracting representatives, including those associated with civil affairs units, can also provide guidance on the available labor pool, HN contractors, and bid submission procedures and guidelines. If the project is congressionally funded, DD Forms 1391 are required and can be prepared by a service member with the proper expertise and experience. Upon completion, DD Forms 1391 must be reviewed and certified by the appropriate level commander or his properly designated representative.

(c) Construction. Construction of key facilities, in particular those required to support survivability measures, should begin as soon as plans are approved. Construction may be accomplished by military engineer units, contractors, or HN personnel (both HN contractors and HN personnel under military unit supervision). Base camp planners must determine, in conjunction with the construction unit, the proper sequence of events and the critical path required to execute construction in a timely and efficient manner. HN laborers and contractors may not adhere to expected construction and safety standards. The implementation of an effective quality assurance and quality control plan is essential to maintain standards, conserve resources, and maintain safety. In the often fluid nature of deployments, logistic and labor shortages can also arise at short notice. Where possible, anticipate and plan for delays and ensure adequate lead time to accommodate logistics requirements.

(7) *Maintain and update plans*. All construction projects require the maintenance and updating of construction plans. As these plans are altered, change drawings and diagrams must be completed. The contract must specify receipt of as-built plans for each portion of a project before payment for that portion or risk failure to capture the information. These plans are especially important where safety or environmental matters are involved. These include areas such as electrical systems (especially if buried lines are involved), sanitation systems (such as buried sewer lines, sewer lagoons, and latrine pits), ammunition holding areas, training areas (especially those that produce unexploded ordnance (UXO), land fills/burn pits, and hazardous material (HM)/hazardous waste (HW) storage and disposal sites. In addition, the land use plan, the tabulation of existing and required facilities (TAB), and general site plans should be updated and records maintained. Plans should initially be maintained at the office of the base camp mayor or the base camp engineer. Theater guidance will provide further information on their final disposition. In all cases, ensure that coordination is made for the handoff of all plans when units or responsible parties are changing (such as during unit rotations).

(8) *Cleanup, closure, and archive*. As stated earlier, planning for base camp cleanup and closure early in the process may mitigate problems later. Depending on the situation, base camp cleanup and closure actions can be quite extensive. Significant activities include environmental cleanup, removal or destruction of facilities, turnover of facilities to the property owner or the HN, and removal of materials (see Chapter 10).

2-3. Overview of Base Camp Planning Considerations. Base camp planners must consider a number of areas when proceeding through the BCDP process. These areas are considered where and when it is appropriate to address them. Quite often, planners will need to address competing requirements and develop solutions that meet the tactical or operational situation. Many of these will be discussed in greater detail in other chapters; however, this section provides an overview of some the issues that base camp planners will have to address—survivability measures, functional areas, facility standards, facility construction, infrastructure, and environmental considerations.

a. Survivability measures. Survivability measures provide cover and mitigate the effects of enemy weapons on personnel, equipment, and supplies. These measures range from employing camouflage, concealment and deception to the hardening of facilities, C2 nodes, and critical infrastructure. Survivability is integrated throughout base camp planning and is often the first area considered. Survivability measures include establishing base camp security, such as perimeter walls and berms and entry control points (ECPs); protective construction to protect structures against damage; and the proper location of structures and facilities to help reduce the chances of being damaged. In addition, certain safety setbacks may be required, or at least desirable, to keep living and working areas away from perimeter walls and fuel and ammunition storage areas. Planners must work with force protection experts and the units that will occupy the camp to identify survivability measures to be implemented and integrated into the overall base camp plan (see Chapter 8).

b. Functional areas. Certain functional areas are often grouped with, or next to, other areas, based on affinity relationships. Simply put, these are areas with the same general purposes (such as personnel housing) which can efficiently exist next to each other and enhance operational effectiveness and quality of life. For instance, housing areas may be located next to areas dedicated to recreation, but may not work well adjacent to airfields. Depending on the size of the base camp and the commander's desires and requirements, the use of functional areas and affinity relations may play an important part in developing the land use plan (see chapter 6). While there are no set definitions of functional areas or affinity relationships, some typical divisions include—

- Housing (US military, HN military, government civilians, and contractors).
- Administration (including command posts and medical facilities).
- Maintenance (to include motor pool areas).
- Logistics (including warehouses, water, and fuel storage areas).
- Airfields (helicopter and fixed wing).
- Recreation (to include PXs, gyms, ball fields, and movie theaters).
- Training (including weapons ranges and impact areas).

c. Facility standards. Facility standards are determined by the camp size, the anticipated life span, governing documents, and the commander's guidance. While JP 3-34 and the theater governing standards provide a general overview of the standards, there may be several different means of reaching the desired end state. For instance, an allowance may specify a certain number of square feet for a chapel, but not specify the construction to be used. Options may include the use of an existing building, tents, new construction, or a prefabricated structure.

d. Facility construction. Planners consider and make recommendations on the best means of constructing facilities. They must consider the materials available, whether structures will be built on-site of prefabricated (such as housing trailers), and the type of labor to be used (military, contractor, or HN labor). The type and availability of these resources may drastically impact the final base camp plans.

e. Infrastructure. The various types of infrastructure associated with base camps depend on its size, function, location, and life span. The camp's supporting infrastructure includes a number of areas such as the road network, power generation and distribution, sanitation systems, and measures to support personal hygiene.

(1) While smaller base camps may have minimal requirements in many of these areas, larger base camps approach the size of small cities with all of the attendant infrastructure issues. Base camp planners work with the supported commander to determine the base camp's requirements and make recommendations. These recommendations take into account—

- The tactical situation.
- The base camp life span.
- Allowable standards.
- Suitability and maintainability.
- Available resources.
- Cost effectiveness (initial cost and sustainment costs).

(2) As stated earlier, there may be several means to achieve the desired result. In some cases, an austere solution such as the use of burnout latrines rather then porta-johns, may be the best solution. Chapter 8 discusses selected infrastructure requirements in more detail.

f. Environmental considerations. Over the last few years, the military has developed a greater understanding of, and placed greater emphasis on, environmental considerations. While often considered to be focused on the protection of natural resources, environmental considerations also include those measures designed to protect military personnel and civilians from the impact of environmental hazards. In addition, the requirement to clean up and close base camps and avoid liability for environmental cleanup costs makes it imperative to include planning for these activities as early as possible in the planning process (see Chapter 10). Base camp planners integrate environment considerations into the BCDP in several areas including—

- Environmental baseline surveys (EBSs).
- HM/HW storage.
- Petroleum, oils, and lubricants (POL) storage.
- Waste disposal.
- Toxic industrial chemical and toxic industrial material (TIC/TIM) hazards.
- Disease vectors.
- Storm water runoff.
- Dust abatement.
- Natural and cultural resource protection.

CHAPTER 3

The Military Decision-Making Process and Master Planning Process Relationship to Base Camp Development Planning

3-1. Introduction. This chapter describes both the MDMP and the master planning process. Furthermore, it explains the similarities, differences, and relationships between the two processes and how they support the planner and planning team in analyzing and developing recommendations for each step of the BCDP process. In general terms, both the MDMP and the master planning process facilitate the same goals; both are processes that assist planners in organizing their thoughts by providing a framework that, if followed, will ensure thoroughness, clarity, sound judgment, logic, and professional knowledge to reach decisions. Since the primary customer, the military, uses the MDMP to plan, it is incumbent upon planners to understand this process and how to apply it as a tool to plan missions associated with military operations.

a. BCDP is a process that is typically time-sensitive and mission-driven. While it is progressive and has an established set of steps, it is cyclical in that oftentimes, planners must review the preceding steps to update discoveries and validate recommendations to ensure that the best possible solution is put forward for decision. The process determines and documents the physical layout of properly located and sized, interrelated land areas, facilitates, and utilities to achieve maximum mission effectiveness. It considers all factors including maintainability and expansion capability. To accomplish this task, planners can use the MDMP or the master planning process steps to develop feasible, acceptable, and suitable solutions to each of the steps of the BCDP process.

b. The *military decision-making process* is a planning tool that establishes procedures for analyzing a mission, developing, analyzing, and comparing courses of action against criteria of success and each other, selecting the optimum course of action, and producing a plan or order (FM 5-0). The MDMP applies across the range of military operations and is used by commanders and their staffs to organize their planning activities, to share and ensure a common understanding of the mission and the commander's intent, and to develop effective plans and orders.

c. *Master planning* is a continuous analytical process which involves evaluation of factors affecting the present and future development of an installation (Technical Manual [TM] 5-803-1). While not stated, the steps of the process also have application to the development of base camps since the development of an installation or a base camp shares many of the same goals.

3-2. The Base Camp Development Planning Process and the Military Decision-Making and Master Planning Processes. The BCDP process, in simple terms, is 'master planning' focused on base camps. It is accomplished much like the planning required for any system or decision that requires a coordinated and synchronized set of steps or actions to accomplish a long-term vision and subsequent objective. Master planning facilitates this

planning with a set of steps similar to the MDMP steps. Since the MDMP is the primary planning tool used by the military, it is reasonable that it would be the preferred method for base camp planning. It is important to understand that whether the steps of the MDMP or master planning are used to reach decisions for the steps of the BCDP process, the results will be the same. In a general sense, the steps of the MDMP or the master planning process provide the methodology to collect, organize, and evaluate data that is pertinent to each of the BCDP steps. Figure 3-1 shows the similarities between the steps of the MDMP and master planning.

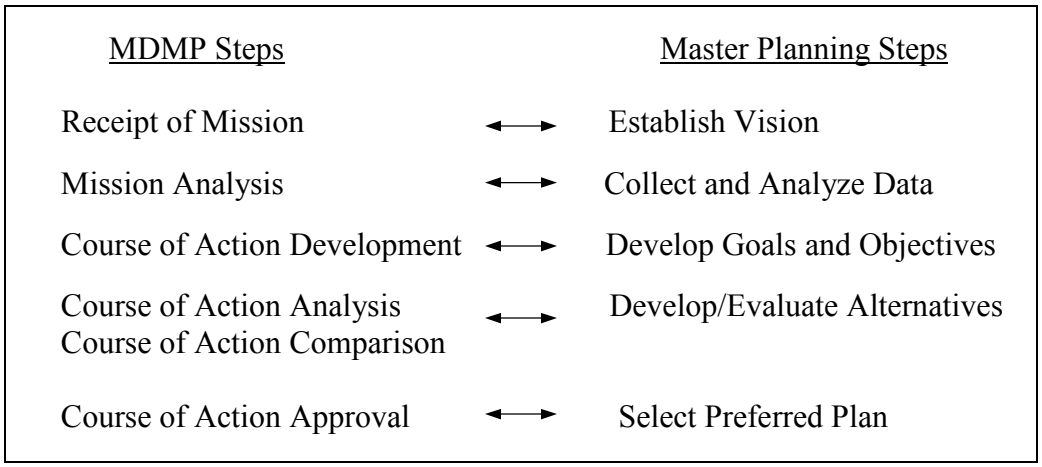

Figure 3-1. MDMP and master planning similarities

a. *Receipt of mission or establish vision*. The BCDP process begins when notification is given to the planning team that a base camp has been proposed or is to be established. Typically, this notification (mission or vision) is received from a Service Component command, a CCDR, or directly from an operational unit. The method of generating the mission to develop a base camp (contingency plan, OPLAN, or OPORD) usually determines the time available and the depth of planning necessary to support that mission. When receiving the mission, the planning team should attempt to collect as much data as possible concerning who, what, when, where, why, and how of the base camp mission. Answering these questions allows the planning team to move to the next step, mission analysis.

b. *Mission analysis or collect and analyze data*. Mission analysis is crucial to planning as both the process and the products assist planners with situational awareness and determining the scope of their mission. Determining the military mission, the number and type of camp occupants, the primary function of the base camp, and the commander's intent will provide the planner a frame of reference to begin base camp development. It is a continuous process of updating and evaluating new or discovered data. Following are some of the tasks that should be accomplished during mission analysis (see Chapter 4 for a more detailed discussion):

- Identify specified and implied tasks, ensuring that the team understands each task's requirements and the purpose for accomplishing each of the tasks so that they are able to identify the essential tasks that must be accomplished to successfully accomplish an individual step of the BCDP process and subsequently, the development of a viable base camp.
- Evaluate the assets available to the planning team. Having the right and sufficient resources (expertise, time, and funding) should be identified and corrected, if necessary, as soon as possible in the process.
- Determine constraints or restrictions placed on the planner in the design and development of the base camp; for example, a commander may dictate that the base camp have a modular design.
- Identify the facts and assumptions associated with the mission. The facts are typically derived from reliable data sources such as orders or directives and/or information confirmed by the appropriate customer. Other information relevant to the situation, but not confirmed, should be listed as an assumption.
- Assess the risk associated with the mission to both the team and the base camp project. For example, if the team is tasked to select a site, there could be risk to the team if the base camp is to be located in hostile territory. Conversely, if they are not allowed to make an 'on the ground' reconnaissance, they may not make an accurate assessment of the site. Minimize the risk by incorporating all possible geospatial and intelligence information about the projected site.

c. *Course of action development or develop goals and objectives*. The remaining steps of the MDMP or the master planning process are most commonly used to support the BCDP process steps of site selection, land use planning, general site planning, and cleanup and closure. Using the information gained from the mission analysis, the planning team should begin to develop courses of action (COAs). In optimal situations, the team should strive to develop three COAs with the screening criteria of feasible, acceptable, suitable, and distinguishable. During every step of the BCDP process, the planner must continue to request and develop information about the projected site. A description of the screening criteria is as follows:

- Feasible. A COA is considered feasible if it allows the team to accomplish the mission within the available time, space, and resources available.
- Acceptable. A COA is considered acceptable if it justifies the cost in resources.
- Suitable. A COA is considered suitable if it will accomplish the mission and comply with the customer's intent/guidance.
- Distinguishable. A COA is considered to be distinguishable if it differs from the others.

d. *Course of action analysis/comparison or develop/evaluate alternatives*. After the planning team has developed the COAs, they must analyze and compare them to determine which ones provide the 'best solution' for recommendation to the customer/commander. To accomplish this, the team should complete the following steps:

- Review any remaining assumptions to ensure that they are still valid and if or how they will significantly impact or influence a COA. If it is determined that an assumption could invalidate a COA, the assumption should be resolved before further COA analysis.
- Develop evaluation criteria to evaluate the COAs against each other. The evaluation criteria are derived from information gained through mission analysis, technical expertise, experience, and any information that the customer has identified as critical or significant (see Table 3-1). While there is no established number of evaluation criteria selected, the criteria should be limited to a manageable number and provide a degree of differentiation between the COAs.

Table 3-1. Examples of evaluation criteria for site selection, land use planning, and general site planning

Site Selection	Land Use Plan	General Site Plan
Soil Condition	Size	AT/FP Considerations
Probability of Natural Events	Security	Population Proximity
Water Availability	Functional and Operational (Affinity) Relationships	Site Access
Sewage	Utilities/Waste Disposal	Terrain, Slope, Drainage
Power Supply	Environmental Sensitivity	Existing Vegetation
Environmental Conditions	Sewage Treatment/Disposal	Prevailing Winds
Communications Availability	Training Areas	Climatic Orientation
Medical Facility Proximity		Affinity Relationship

- Analyze the advantages and disadvantages of each of the evaluation criteria against each of the COAs. In some cases, the advantages and disadvantages analysis may be subjective; however, a clear positive or negative for each of the evaluation criteria should be demonstrated.
- Weight the evaluation criteria based on the outcome of the subjective analysis and the customer's guidance, and compare the COAs using a decision matrix. The use of either a maximization or minimization chart is acceptable. Table 3-2 provides a simplified example of a decision matrix using weighted evaluation criteria. In this example, the weighting has been designed to reflect the larger numbers (maximization chart) being the better COA.

Table 3-2. Example decision matrix using weighted evaluation criteria

Evaluation Criteria	Weight	COA 1	COA 2	COA 3
AT/FP Considerations	5	1(5)	2(10)	3(15)
Population Proximity	3	2(6)	1(3)	3(9)
Site Access	2	3(6)	1.5(3)	1.5(3)
TOTAL/Weight Total		6(17)	4.5(16)	7.5(27)

e. *Course of action approval or select preferred plan*. As COAs are delineated, it becomes necessary for the planning team to provide the customer with a presentation of options in an effort to obtain a decision. To reach a decision on the recommended COA, the team must prepare a decision briefing. (See Appendix B, Figure B-1, for the decision briefing format.) A decision briefing obtains an answer to a question or a decision on a COA. To facilitate a successful briefing and ultimate decision, the planning team must develop comparison charts, sketches, and other products that will enable the customer to visualize and distinguish among the alternatives. Following the accepted decision briefing format that includes detailed supporting products will ensure that the customer can select and approve a COA even if that individual has not previously participated in the process.

CHAPTER 4

Preliminary Planning

4-1. Introduction. Preliminary planning incorporates those initial activities that assist the planner in understanding the scope and magnitude of the mission while simultaneously preparing the planner for follow-on actions as a part of the BCDP process (see Figure 4-1). The purpose of preliminary planning is to help planners think critically, develop situational understanding, anticipate decisions, and simplify complex issues to the point that they can be better identified and managed. Preliminary planning also assists in understanding organizational structures, allocating resources, directing and coordinating future actions, and preparing for the next step in the BCDP process.

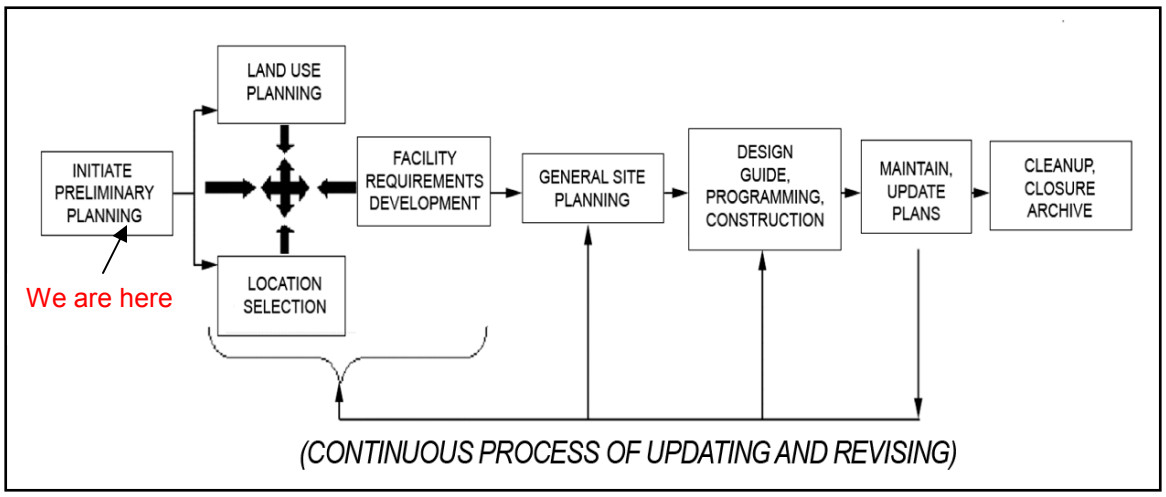

Figure 4-1. The base camp development planning process

a. Mission analysis is an ongoing step that involves the study of the various factors, including the mission, the tactical and political situation, economic and cultural variables, specified standards, and available resources that can impact BCDP. It is the cornerstone of the BCDP process. Throughout the development of the base camp plan, planners constantly review facts and assumptions, react to unanticipated requirements and events, and refine the plan. These considerations are drawn from an analysis of the base camp's mission, size, and allowable standards and operationally related variables. Even in circumstances where planners become involved in the process after it has already started, they must still integrate the original analysis, and continue to revisit it, as they proceed with their mission.

b. The preliminary planning steps include—

- Analyzing the mission statement and/or OPORD to obtain key information.
- Requesting or developing key information that may not yet be available.
- Analyzing the supported units to determine unit organization, functional requirements, and personnel and equipment numbers.

- Reviewing doctrine to determine what the base camp is allowed in terms of facilities and associated standards.
- Analyzing the various operational variables to determine their impact on BCDP.

4-2. Analyzing the Mission Statement and the Operation Order. Mission analysis initially involves examining the stated mission and then developing lists of specified and implied tasks, facts and assumptions, and various constraints. The mission itself may come from a simple request for support or a mission directive, or it may be imbedded in the OPORD. Within the OPORD it is usually found in the sections that cover tasks to subordinates, in the coordinating instructions, or in the engineer operations annex for Army orders. (In a joint order it may be found in the engineer support plan.) Planners at all echelons analyze this information to determine some of the initial planning requirements. These requirements include determining and developing lists of specified and implied tasks, facts and assumptions, and any specific constraints imposed on the mission. Reviewing this information will generally result in a large number of questions that will need further answers. Planners then develop RFIs that can be sent to higher headquarters, supported units, and other agencies to obtain answers and clarification.

a. Receive the mission. A field force engineering (FFE) element may receive a mission statement or directive to provide support to base camp construction. This mission statement will include general information on the "who, what, when, and where" of the mission. It is an abbreviated statement of the task that base camp planners must execute. This mission may call for the team to field a specific request, such as for the design of a sewerage lagoon, or it may be a directive to support the establishment of a base camp from the ground up. In other cases, the FFE element will receive a more detailed plan, such as an OPORD, that provides a greater amount of mission information. The first step in mission analysis, once the mission statement or directive has been received, is to analyze the information contained within the document. In addition to reviewing the mission assigned to the base camp planning element, the team should also review the mission statement and the OPORD of the supported and higher units to obtain additional information.

b. Specified and implied tasks. Each mission, whether the base camp planning mission or the supported unit mission, will have specified and implied tasks. FM 5-0 defines a *specified task* as a task specifically assigned to a unit by its higher headquarters. It further defines an *implied task* as a task that must be performed to accomplish a specified task or the mission, but is not stated in the higher headquarters order. Implied tasks are derived from a detailed analysis of the higher headquarters order, the enemy situation and COAs, and the terrain. A review of the information provided about the mission may state that the planners must coordinate with the 1st Brigade Combat Team (BCT) to develop a base camp, at an unidentified location, capable of supporting up to 3,500 personnel for up to three years and must include a helicopter landing area able to support up to 12 helicopters at a time. This short statement provides a number of

specified and implied tasks that planners must review to determine what additional information is required.

(1) Specified tasks include—

- Coordinate with 1st BCT.
- Develop a 3,500-person base camp.
- Plan for the construction of a helicopter landing field.

(2) A number of implied tasks can be inferred from this statement. Some of these implied tasks include—

- Determine the task organization of the BCT (what it includes and what its needs are).
- Confirm the antiterrorism/force protection (AT/FP) standards for the base camp.
- Conduct a site reconnaissance.
- Develop a land use plan.
- Obtain information on funding sources.
- Coordinate with the aviation unit to determine specific requirements.

c. Facts and assumptions. As part of the planning process, base camp planners develop a list of facts and assumptions. According to FM 5-0, *facts* are statements of known data concerning the situation, including enemy and friendly dispositions, available troops, unit strengths, and materiel readiness. An *assumption* is a supposition on the current situation or a presupposition on the future course of events, either or both assumed to be true in the absence of positive proof, necessary to enable the commander in the process of planning to complete an estimate of the situation and make a decision on the course of action.

(1) Facts are derived from information in the OPORD or other information sources. They may include quantifiable items such as strength numbers, the amount of money available for construction projects, the size of the available base camp area, and the soil type at an airfield location. Facts may also include more intangible items such as the overall threat level and the suitability of the local transportation network.

(2) An assumption is appropriate if it meets the tests of validity and necessity. FM 5-0 states that *validity* means assumption is likely to be true. “Assuming away” potential problems, such as weather or likely enemy COAs, may produce an invalid assumption. FM 5-0 defines *necessity* as whether the assumption is essential for planning. If planning can continue without the assumption, it is not necessary and should be discarded. For example, an assumption might be that the gravel source to be used for road construction in the base camp will be adequate or that local vendors will continue to be willing to provide their services. If there is significant risk associated with an assumption, it should be noted.

d. Constraints. *Constraints* are restrictions placed on the command by a higher command. A constraint dictates an action or inaction, thus restricting the freedom of action a subordinate commander has for planning (FM 5-0). Constraints may be specified or implied from information contained in the OPORD or other documents, or they may come from information received as a result of coordination with the supported unit. Constraints may reflect a number of operational variables, but will quite often be based on political, military, or resource issues. Some examples of constraints are—

- Base camps must use established facilities.
- Camps must be located to avoid overwatching terrain.
- Lumber sources are not adequate for construction.
- A particular vendor must be used for electrical supplies.

e. Commander's intent and guidance. The guidance received from the commander is a key source of planning information. In some cases, it takes the form of specified and implied tasks or constraints. In other cases, it is general guidance that the commander wants to see applied when and where possible. The commander's intent provides his vision on how he wants to see the camp look, how he wants it to operate, and what his construction priorities are. For example, the commander may direct that emphasis be placed on quality-of-life issues, such as shower facilities, that may otherwise exceed the established standard allowances. Base camp planners integrate the commander's guidance into the BCDP and also advise the commander on what is allowable, feasible, and efficient.

4-3. Analyzing the Supported Unit's Mission and Requirements. After analyzing and extracting available information from the mission statement and the OPORD, planners obtain additional information from the supported units scheduled to occupy the base camp. Much of the information that base camp planners need can be obtained by this coordination with the supported unit. Early coordination and the submission of an effective list of RFIs will assist planners by reducing the time required to gather information, thereby increasing the amount of planning time available. Analyzing the supported unit and its mission will enable planners to—

- Identify unit functions.
- Determine unit structure.
- Determine the planning strength for the numbers of personnel and equipment.
- Define relationships among unit functions.

a. Identify unit functions. Identifying unit functions aids base camp planners by providing information on what the overall unit mission is and how it can be expected to operate. This, in turn, will assist planners in developing a base camp plan that meets the unit's requirements. Identifying unit functions includes determining what its primary mission objectives might be, what types of activities it might perform, and what its responsibilities and capabilities might be.

(1) One means of obtaining information on unit functions is from direct coordination with the supported unit. Conversations with unit personnel that represent its various functional areas—operations and training (operations staff officer [S-3]), adjutant (human resources staff officer [S-1]), and supply (logistics staff officer [S-4])—will reveal very quickly how the unit views its structure, mission, and unique requirements. Coordination with civilian agencies being supported for the establishment of base camps in support of disaster relief operations will provide similar information.

(2) Another means of obtaining information on unit functions is by referring to the mission and operational information found in the unit's modified table of organization and equipment (MTOE) or table of distribution and allowances (TDA). Each Army unit has an MTOE or a TDA that provides general information about its mission and employment. It also contains very detailed information about its personnel and equipment numbers and types. While difficult to read and understand, these documents can provide valuable information if direct unit coordination is not possible.

(3) As an example of determining unit functions, a headquarters and headquarters company (HHC) from a BCT is one of the units that will occupy a base camp. An analysis of its operational information, shown in Figure 4-2, page 4-6, reveals several things (noted in bold type), including its mission (to provide C2), how it is employed (may deploy as more than one command post [CP] element) and some of its functional needs (administration, communications, logistics warehousing areas, and such). While this is an imperfect means of obtaining this information, it will still provide planners with a basic understanding of the unit's function and mission.

OPERATIONAL INFORMATION

MISSION. To provide **command, control, and supervision** of the operation of the brigade and attached units. The headquarters and headquarters company (HHC) also provides operating personnel to support functional requirements for the headquarters.

EMPLOYMENT. (1) The HHC operates as a **tactical and administrative headquarters**. The brigade headquarters **is organized with a tactical (TAC) command post (CP); a main CP, which consists of the tactical operations center (TOC); and a brigade support area (BSA).** (2) The TAC CP, located in the vicinity of the maneuver battalions, consists of representatives of the S-2, the S-3, and the command section. It plans and advises on mission strategies and moves as the tactical situation dictates. (3) The main CP consists of the TOC. **The TOC is divided into cells** of coordinating and special staff personnel and representatives from other units necessary to sustain combat operations and plan for the future. (4) The BSA **provides combat service support functions** to the brigade combat team (BCT). The **communications element at this location connects to the division signal center when attached to a division**.

CAPABILITIES. (1) This unit provides: (a) **Command, control, supervision, and staff planning of the operation of the BCT and attached units.** (b) **Operation of the TAC CP, the main CP, and the BSA.** (c) A **provost marshal** operations section to exercise operational control over assigned and attached military police (MP) units. (d) **Chemical, biological, radiological, and nuclear (CBRN) staff** services to the BCT headquarters for smoke/decontamination operations, radiation monitoring and chemical detection, and CBRN reconnaissance to support assigned and attached units. (e) **Personnel administration to organic and attached personnel.** (f) **Religious support** to organic and attached personnel.

Figure 4-2. An example of operational information being used to determine unit functions

b. Determine unit structure. Further analysis of the unit will provide information on its structure. The planner's interest is ultimately in determining the facilities (buildings, land, and infrastructure) required to support the mission. This analysis will provide additional information on what the unit may need in order to accomplish its mission. Once again, direct coordination with the supported unit is the best method of obtaining this information.

(1) The example shown in Figure 4-3 is for a heavy brigade combat team (HBCT). The HBCT includes its organic HHC, two combined arms battalions, a cavalry squadron, an artillery battalion, a brigade support battalion (BSB) (to provide logistics), and a brigade special troops battalion. Of course, BCTs may also have other elements task-organized to them.

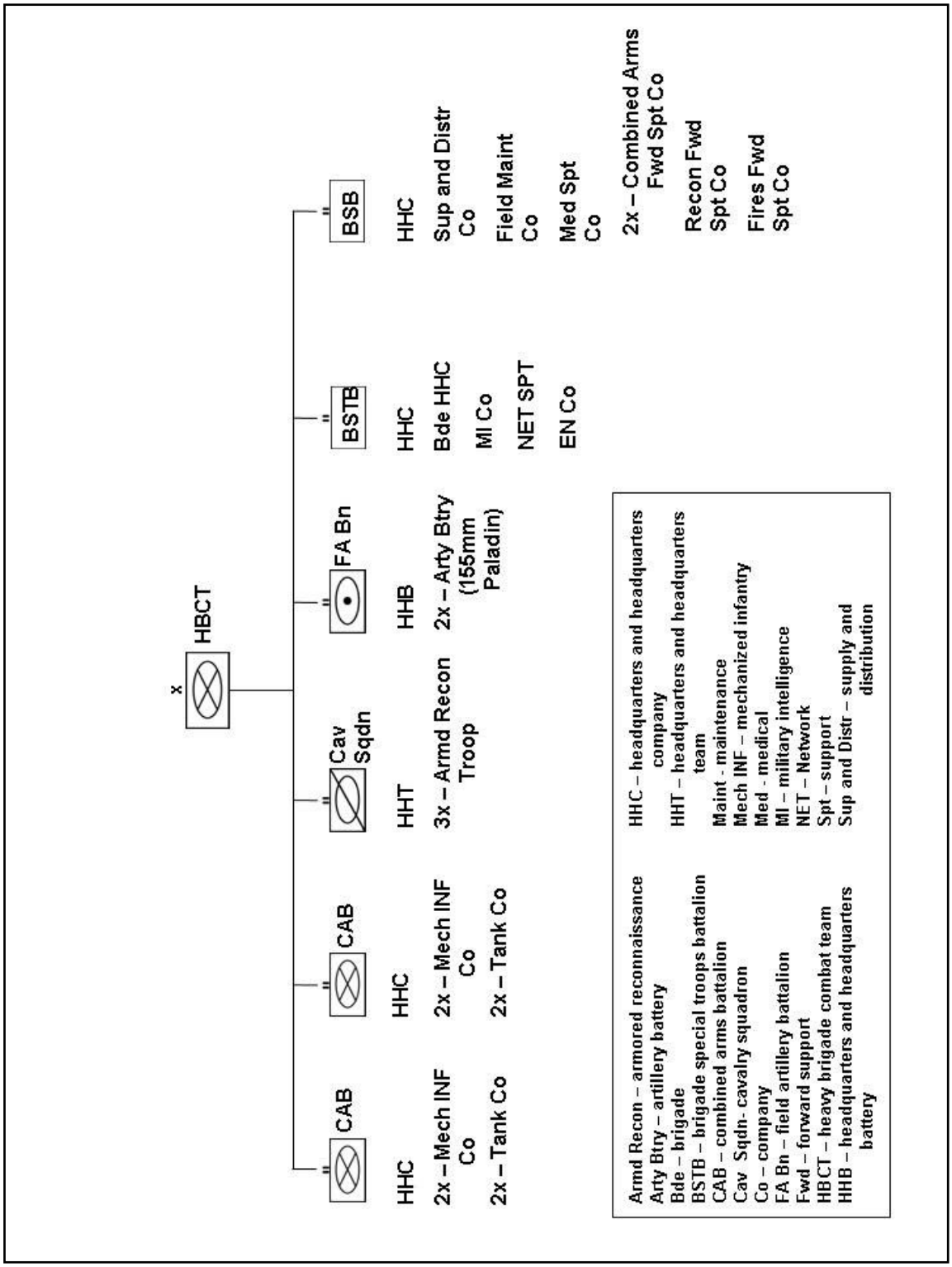

Figure 4-3. An example of a unit structure for a heavy brigade combat team

(2) As a base camp planner, the presence of certain types of units within the organization's structure may result in certain assumptions and implied tasks. If the artillery battalion will provide fire support, it may require areas to set up the firing batteries. If the BSB includes maintenance elements, vehicle parking areas, maintenance facilities, and storage areas for parts may be required. Planners can use this information to further develop the lists of facts and assumptions and specified and implied tasks and submit them to the supported units as RFIs.

c. Determine the planning strength for the numbers of personnel and equipment. Coordination with the supported unit and a review of MTOE and TDA information will provide planners with an estimate of the personnel and equipment to be supported within the base camp. This information is critical to base camp development, as it is the basis of the facility allowances and requirements further discussed in Chapter 7.

(1) *Personnel*. While base camps may be designed to support particular military units, they are usually referred to as being designed to support a specific population size. This distinction is important because units that occupy base camps change over time, and additional personnel are often present beyond those assigned to a particular unit or units. Coordination with the initial units and an analysis of the MTOE and TDA data form the basis for the initial personnel estimate. Further analysis is required to determine additional population requirements that result from other sources. The number and types of personnel not only drive the overall base camp size requirements; they may also influence base camp land use planning as there are often requirements to establish separate working and living areas for military, HN, and contractor personnel that affect overall utility requirements. The personnel living and working in a base camp typically come from six sources. These sources include—

- Military personnel that live and work on the base full time.
- HN or multinational military personnel on base full time.
- Civilian government personnel and civilian contractors on base full time.
- Personnel (military and civilian) that may be transient (such as truck drivers from transportation units that are on-site temporarily).
- HN day workers that are on base during work hours only.
- Surge capability to support rotating units conducting transfer of authority.

(2) *Equipment*. Military units deploy with a variety of equipment and vehicle types. The equipment and vehicles on a base camp also include a variety of civilian vehicles used by contractors for logistics and base camp operations. In some cases, equipment may require special considerations, depending on their mission. These issues may include significant operational and safety standoffs, space for bulk water and bulk fuel operations, and line of sight for communications systems. In all cases, the amount and type of equipment and vehicles will determine the relative size of areas devoted to vehicle parking and maintenance. To effectively determine the actual equipment requirements and constraints, the planner should maintain continuous dialogue with the unit and update plans as appropriate.

d. Define relationships among unit functions. Based on an analysis of unit functions and organization, planners can develop relationships between the various elements. For instance, certain identified functions for the HHC included personnel administration, supply, communications, and C2. Elements within the entire HBCT may also be grouped loosely into these areas; for example, the BSB providing supply support. These initial groupings can form the basis for affinity relationships and functional areas as detailed later in Chapter 6.

4-4. Base Camp Allowances and Standards. As noted in Chapter 1, base camps may be described by the functions they perform, such as a main support base or a logistics support base. The facilities on these bases, and the standards that they are constructed to, is a function of the base camp's purpose, size, and anticipated life span. JP 3-34 provides the baseline standards for base camps based on anticipated life span, while other documents provide information on allowable facilities. (See Appendix C for guidance on allowable facility standards based on JP 3-34.) Using this information, planners can make an initial analysis of the types of facilities, construction standards, and resources that they can expect to use. This information, in turn, may generate RFIs and additional planning considerations. For example, if a 3,500-person base camp is being developed in Europe to support an HBCT and supporting military personnel and civilians for three years, planners would use the applicable construction standards from JP 3-34 and would obtain an estimate of the allowable facilities for a base camp of that size and life span from the Red Book.

4-5. Operationally Related Variables. Chapter 1 provided a brief introduction to operationally related variables, as outlined in FM 3-0, that planners use as a guide when conducting mission analysis. These variables, present in differing forms and exerting different amounts of influence, provide planners with a framework to analyze the various aspects of the mission and the environment. Additionally, these operational variables may serve as the basis for the evaluation criteria developed for COA analysis (see Chapter 3). While not all of them have equal weight, most will in some way impact the environment in which the base camp is located, designed, built, and managed.

a. Political variables. While at first political issues may not seem to be a matter for base camp planning, the political environment can influence the decisions that planners make. Operations may be conducted in environments that can be described as permissive, semipermissive, or forced entry. These environments provide, among other things, an indication of the levels of government and local support that can be expected. The relative levels of support that the national and local governments provide, and the services that they are capable of providing, may impact base camp decisions. In addition, the political environment may be influenced by other forces, such as major transnational corporations, private security companies, and various NGOs. The political situation will often impact the base camp's location, the standards used, and access to resources.

(1) *Effect on location*. In many circumstances, the HN government may provide a specific location or may offer locations for assessment. These locations may be based on

several factors, including the effect on ethnic, religious, and political groups, the need to provide economic development to certain areas of the country, or the desire to avoid negative publicity that may result from U.S. bases in certain areas. When more than one site is offered as a base, planners must evaluate their relative merits and make a recommendation. Often these locations will not be ideal, and planners must work to provide the best base camp plan, based on the location.

(2) *Effect on standards*. The image that U.S. forces and the HN wish to project may impact base camp standards. Politically, it may not be possible or desirable for U.S. forces to project the image that they are staying in the country for an extended period. Conversely, U.S. forces may wish to project the image that they are there to provide long-term stability. The numbers and types of facilities developed and the construction methods and materials used often provide an impression of the mission's intent. For instance, if U.S. forces have stated that the mission is of a short duration, but then begin to build structures using concrete, the impression to the local population becomes that we intend to stay for an extended period. In some cases, planners must temper what may be allowed (based on the established standards) with what best fits the mission.

(3) *Effect on resources*. The political situation, both in the HN and in surrounding countries, greatly impacts resource availability. If the HN is willing and able to provide a significant amount of support, it can greatly assist base camp planners in determining resource availability. If the HN is unwilling or unable to provide that support, obtaining resources can be more difficult. Even when resources are available, the desire by the local government to use certain vendors, for economic, cultural, religious, political, or personal reasons, may impact the availability, types, and costs of resources used. For example, if the local government wishes to patronize a certain local leader, it may be necessary to procure materials or workers from that person, even if it is not otherwise the best choice. Relations between neighboring countries may also impact resource availability. In some cases, nations may prevent or delay the movement of materials necessary for base camp construction. In other cases, the political environment may require that certain countries contribute resources. In either case, delays at border crossings are a typical cause for delays in material deliveries. While base camp planners may not be responsible for making or influencing these decisions, they are certainly influenced by them and must remain aware of them.

b. Military variables. Planners must consider many military aspects related to the mission, the situation, the military organization, and requirements of units that will occupy the base camp. Some of these considerations also pertain to base camps developed for civilian applications such as disaster relief. These considerations include quantifiable aspects such as numbers of personnel and equipment, organizational history, and dynamics. Planners work to integrate these various military aspects into the base camp planning process and use them as tools to evaluate and make various decisions. Requirements to address I/R issues will alter the planning considerations for a base camp, but the same basic principles apply.

(1) *Equipment*. Equipment types and the associated ammunition and fuel storage requirements can have a significant impact on base camp planning. Base camps may be designed to house specific units or a specific population size, with units varying over time. Nevertheless, certain equipment types will require specific design considerations. If U.S. forces are constructing the base camp, the equipment available to support base camp construction and sustainment should be considered. When planning for equipment requirements, coordinate with the anticipated occupying units or subject matter experts (SMEs) on equipment types and requirements (see paragraph 4-3).

(2) *Manpower*. Base camps are built, sustained, and inhabited by both military and civilian personnel. These include full-time base camp residents, part-time residents (such as personnel assigned to transportation units that are often on the road), and day workers who occupy the camp during their work hours. Each of these groups may have specific requirements. Base camps often include a provision to support surge populations such as during unit rotations. The overall base camp population and the overall size and associated infrastructure requirements determine facility allowances. Paragraph 4-3 provides additional planning concerns related to base camp population.

(3) *Doctrine*. Various references impact base camp operations. These include FMs, service regulations, theater-specific base camp guidance (such as the Sand Book), and other documents including status-of-forces agreements (SOFAs) and DOD Publication 4715.5-G. JP 3-34 provides the basic doctrine that establishes base camp standards and allowances. Planners should be aware of the relevant documents that govern base camp location selection, construction, operations, sustainment, and closure. The Judge Advocate General (JAG) of the various services can provide information on many legal issues associated with base camps. These legal issues include liabilities, real estate leasing, contracting, purchasing, and such.

(4) *Training levels*. The level of training possessed by personnel involved in construction and sustainment may impact decisions regarding the base camp. Base camp planners must be prepared to tailor their designs to the available skill sets. For instance, military engineers are not typically trained to perform their tasks at the same level as civilian contractors within the United States. While skilled in basic construction, they are not generally trained or equipped to perform tasks such as dry wall installation or installing commercial-type central heating and air systems. In addition, much of the locally available HN labor pool may be limited in terms of their construction abilities. While civilian contractors with the necessary skills to perform more complicated construction may be available, the financial and tactical situations may prevent extensive use of them. When planning base camps and developing designs for buildings and infrastructure, planners must ensure that they are kept as simple as possible, consistent with mission accomplishment and the skill sets of the available labor pool.

(5) *Resource constraints*. Resource constraints are one of the greatest challenges that face base camp planners. They impact everything from determining the best location, to design and construction, to the ability of the camp to sustain itself. These constraints

include materials, money, personnel, equipment, and time. Some of these constraints are directly related to base camp planning while others, such as the availability of transportation assets, have an indirect but still important effect. Planners keep resource availability in mind when determining site selection and designing camps in order to determine if the designs are practical and feasible, given the materials, money, manpower, and equipment available. Subparagraph 4-5.c. covers additional economic issues related to resource constraints.

(6) *Leadership*. Decisions regarding base camp planning reflect the integration of standards and allowances, technical expertise, and leadership decisions. Base camp planners coordinate with military and civilian leaders to integrate their vision and priorities into the final base camp plan. Planners review the mission statement and the commander's intent, and cooperate with and advise leaders on the best design and management practices that will meet the commander's goals. Often the commander's guidance may not be appropriate or attainable. In these situations, base camp planners provide alternatives that will most closely meet the commander's intent.

(7) *Organizational culture*. All organizations have a unique culture that influences decision making and operations. This culture often defines the organization and establishes a common framework of understanding. Planning for base camps is in many ways influenced by this. If the organization values quality of life over certain operational requirements, factors which influence it will be of greater importance. For instance, the desire of the organization to provide for recreation facilities may require planners to integrate them into the base camp plan. Sometimes this integration may come at the expense of other base camp functions. In some circumstances, the desire to maintain separate quarters for officers and enlisted personnel, or military, civilian, and contractor personnel, may require changes to base camp site planning. Planners may also find themselves working with military, HN, and civilian leaders who may come from very different organizational cultures. Through constant communication and feedback with the organizations they support, planners can determine the organization's needs and develop acceptable solutions.

c. Economic variables. Economic issues that impact base camp planning deal primarily with resource and manpower availability; however, they also include areas such as finance, contracting, and property rights. These issues often have both direct and indirect effects on base camp planning.

(1) *Resource availability*. As noted in subparagraphs 4-5.a. and 4-5.b., certain resources and manpower may be available in the HN that can support or detract from base camp planning, design, and construction. In addition, the political and military situations will also impact the availability of various resources. Planners take these issues into account when developing the overall base camp plan.

(2) *Financing*. As with any project, base camps require money for construction, operations, and sustainment. Funding may come from different sources, and certain

sources may be "fenced" or limited for use in only specific circumstances. There may also be requirements to support certain aspects of the local economy by the purchase of materials and services.

(3) *Contracting*. Based on the base camp plan, there may be a requirement to use contractors for all or part of the base camp's construction. This requirement may come from political requirements or from practical concerns pertaining to base camp construction and sustainment. If contractors are used, ensure that contracting experts are contacted for advice on the proper procedures and limitations.

(4) *Property rights*. Base camps are often constructed on land that was (or is) privately owned. Involvement by military real estate, JAG, and civil affairs personnel is essential to ensure that all legal, ethical, and moral concerns are met before initiating construction. In addition, any land use agreements may require that the land be restored to its original condition. This requirement may create additional challenges for base camp planners to design facilities that are not only temporary, but also easily removable or that present minimal environmental impacts.

d. Social variables. Social issues sometimes play a part in the base camp planning process. In circumstances where base camps may include joint forces, HN forces, or civilians of various nationalities, planners may need to accommodate certain social issues. These social issues may include structures for religious services, separate living areas for men and women, or even separate living areas for certain ethnic groups. While social issues may play a part in base camps that serve primarily a military purpose, they will be more prevalent if the camp is developed with a primary function of supporting I/R or disaster relief.

e. Infrastructure variables. Where possible, base camps are located and planned to make the maximum use of existing infrastructure. Using existing facilities may reduce resource requirements, improve security, speed up base camp establishment, and improve quality of life. Planners may use existing infrastructure as a selection criteria in determining the best base camp location and will also use it to help determine the best locations within the camp for specific base camp functions. The presence and use of existing infrastructure is not, however, the only deciding factor. Concern for the other operational variables must be integrated into the selection process.

(1) Advantages of using existing infrastructure may include—

- Reduced time to occupy and establish the base camp.
- Operational advantages such as existing bunkers, airfields, or storage facilities.
- Improved quality of life for base camp residents.
- Reduced resource requirements.
- Better access to existing power, water, and wastewater systems.

- Relative survivability of structures when existing buildings may provide greater protection than tents or new construction.

(2) Disadvantages of using existing infrastructure may include the following concerns:

- Structures may be unsafe.
- Structures may present an environmental health hazard.
- Connecting to the existing infrastructure (such as water systems) may have a negative impact on the local population.
- Structures may not be suitable for survivability (such as structures that would present a significant terrorist target; for example, hotels).
- Occupying an existing structure may present a negative image of U.S. forces to the population (such as using structures related to the prior regime).
- Structures may overlook the base camp, presenting the enemy with observation and a means to fire into the camp.
- Infrastructure may include industrial facilities that cause pollution and present health hazards.
- Infrastructure may contribute to traffic congestion into and out of the base camp and may present additional AT/FP issues.
- Infrastructure may put U.S. forces into closer than desired proximity to the local population.

f. Physical environment. The physical environment and factors such as terrain, weather, and hydrology will affect many aspects of base camp planning. Location selection in particular will be subject to environmental considerations. In some environmental areas, the selection of construction materials, base camp layout, and infrastructure within the base camp will also be affected. Planners consider several environmental factors when planning for base camps. These factors may not be present in all circumstances or their effect may be negligible. In almost all cases, they are still integrated as part of the planning process. An EBS must be performed to determine the environmental conditions at the site and is often performed in conjunction with an environmental health site assessment (EHSA). The EBS and the EHSA will provide valuable information that will support base camp planning decisions (see Chapter 10).

(1) *Man-made structures*. Base camps are often built in, or next to, urban areas. In some circumstances, it may be possible to integrate existing infrastructure into the base camp. This includes using buildings and facilities, roads, drainage structures, and possibly the existing sewer, water, and electrical networks. Even when existing structures are not used for the base camp, surrounding structures will impact it. These surrounding structures may be beneficial or they may have a negative impact. The use of man-made structures, and their relative benefits, depends on variables such as the location, the structure's usefulness and safety, the impact on the local population, and the political/military situation.

(2) *Climate and weather*. Planners consider the prevailing climate and weather when making decisions about several planning factors. While the actual base camp location will not be based on the climate alone, the climate and weather will impact areas such as drainage, layout, building materials, building design, and other infrastructure requirements such as electrical power generation. Climate and weather may impact base camp planning by—

- Increasing or decreasing requirements for drainage.
- Requiring measures for dust abatement.
- Changing the relative needs for heating and air conditioning systems (and associated electric power requirements).
- Requiring planning for insulating buildings.
- Requiring the burying and insulating of water lines to avoid freezing.
- Suggesting building materials suitable for the environment (within the anticipated base camp life span).
- Requiring the design of buildings (and survivability construction) to withstand snow loads.
- Requiring internal road networks to handle excessive rainfall or to accommodate snow removal.

(3) *Topography*. Topography, generally described as the overall terrain features or the “lay of the land," influences base camp site selection, land use planning, and survivability. While certain types of terrain present few difficulties for base camp planners, other types may require planners to exercise a high degree of engineering and master planning judgment. The advantages and disadvantages of the prospective site’s topography are evaluated against the other selection criteria to determine its relative effect.

(a) Topography exerts a great influence on site selection. Certain locations, such as steep hills and floodplains, will prevent base camp construction in all but the most unusual circumstances. In other cases, the topography may require extensive modification such as extensive earthmoving activities. The overall work effort required to adapt the topography to base camp use may have a significant influence on site selection and land use.

(b) AT/FP measures are influenced by the topography of the base camp location. Generally speaking, it is desirable to establishing a base camp on a terrain feature with good fields of fire and observation of the surrounding area. However, locating certain features within the base camp (such as CPs and fuel storage areas) where they can be easily observed and targeted, is not desirable and should be avoided where possible. Planners must also consider the topography surrounding the base camp. Where possible, do not located base camps where high ground can dominate them and make it easier for enemy forces to observe activities within the camp and to locate and engage targets.

(c) Within the base camp itself, the topography will impact the land use plan and, to a certain extent, the construction measures used. For instance, hilly areas may not be suitable for vehicle parking areas or large buildings where extensive earthwork is required. However, smaller structures may be located there. Flat areas may be difficult to drain and require extensive grading and ditching. The construction methods used may reflect terrain considerations. In some case, it may require less earthwork to construct buildings on piers rather then on concrete slabs. Topography also impacts roads and drainage structures. Steep grades that make vehicle movement difficult and increase erosion may need reshaping to reduce their negative effects. The challenge for planners is to use the terrain to the greatest effect and to develop the base camp plan in a way that minimizes the construction effort involved.

(4) *Hydrology*. Hydrology refers to the movement of surface and subsurface water. The availability of water and the effect that it can have on base camp operations presents challenges to planners. While the availability of potable water may have an influence on base camp planning, surface and subsurface drainage issues typically will have a greater effect.

(a) Surface drainage, whether from existing streambeds or from water movement over the ground's surface, often has a significant impact on base camp operations. The topography, soil type, climate, and rainfall intensity all affect surface drainage. Poor drainage detracts from base camp operations by reducing trafficability and overall quality of life. In certain circumstances, flooding may even occur that can damage or destroy equipment. Surface drainage from areas off the base camp may also introduce pollution and potential pathogens into the base camp area. Additionally, water leaving the base camp area can carry pollutants created by the camp's operations into the surrounding areas, such as agricultural fields. Planning for drainage is one of the first steps in any construction project. Base camp planners integrate these concerns into site selection and land use planning to mitigate their negative effects and also provide assistance in the development of drainage structures and runoff management plans.

(b) Subsurface drainage may allow for the movement of contaminants into and out of the base camp area. These contaminants can include industrial chemicals, POL, and human waste. This movement has the potential to negatively impact groundwater sources used for drinking and irrigation. It is important for planners to understand what hazards subsurface drainage presents and to integrate these considerations into planning when and where possible.

(c) In certain cases, base camps may obtain water from new or existing wells. If a well is located on the site, a study to determine its capacity and water quality should be completed. In cases where it is desirable to drill a new well, a study of the area's hydrology and geology is required to determine if well drilling is feasible. To avoid potential health issues, all wells used should be tested; the water should come from aquifers only and not from dug wells that only tap into the local groundwater supply.

(5) *Natural resources*. The natural resources present in the AO may provide an indication of the materials available for base camp construction. They may also include agricultural lands, endangered species that require protection, and such. Water resources are a particular concern in certain areas of the world.

(a) Nations that have a large forest cover and an associated lumber industry, may be able to provide wood for building materials. Similarly, a desert region will most likely provide materials and laborers skilled in concrete and masonry construction. The local availability of these resources, or their availability in neighboring areas, may influence base camp planning.

(b) Besides impacting resource selection, base camp planners should also consider the impact that the base camp may have on natural resources. Agricultural areas in particular, and to a lesser extent endangered plants and animals, may be impacted by base camp location and operations. As a general rule, it is desirable to avoid locating base camps in areas where they will have a negative impact on natural resources. Planners, in cooperation with military and civilian agencies such as military civil affairs teams, need to ensure that any planning for base camps includes consideration of these issues.

(c) In many areas of the world, water is a scarce commodity. Any plan to use local water sources needs to take into account its overall availability and how the base camp water use will impact the local population. Planning for base camp operations, in particular drainage and wastewater, should include methods to prevent contamination of agricultural areas and water supplies. Planning may also include integrating water conservation and wastewater treatment methods into the base camp design.

(6) *Biological features and hazards*. Other factors, such as disease vectors, dust, air, water and soil pollution, and industrial hazards such as TIC/TIM hazards, will be present in many circumstances. Planners should coordinate with other military and civilian agencies to identify hazards that impact base camp planning and operations and develop remediation plans. Accurate and thorough EBSs and EHSAs will assist in identifying hazards (see Chapter 10).

g. Time. Time is often a critical factor affecting military decisions. Decisions regarding base camp planning are usually made in a tight time line, often requiring planners to operate with less than complete information. Whether planning a base camp for military operations in a foreign country or disaster relief within the United States, planners develop solutions that can be implemented in the time available. Decisions, such as the use of certain materials or construction techniques, will often be made on the basis of when the camp is required for operations. In some circumstances, portions of a base camp may be required for use before completing the entire base camp. Sometimes, a base camp may be constructed using the initial standard in order to provide timely beddown for forces and then be improved to higher standards later when time is not as crucial. An eighty percent solution in time to meet mission requirements may be more valuable than

a one hundred percent solution later. Base camp planners integrate the different operationally related variables into BCDP with an eye to meeting time requirements.

CHAPTER 5

Location Selection

5-1. Introduction. This chapter presents a systematic process for finding the best possible location for developing a base camp either in a TO or in other locations such as will typically be required for stability or civil-support operations. Location selection, as part of the overall base camp planning process, is shown in Figure 5-1.

a. Base camp *location selection* is the process of evaluating a series of possible locations for a base camp. Using an array of available data, a team of functional and operational experts selects and recommends, for command approval, the most suitable location. The situation will dictate whether or not location selection will be needed.

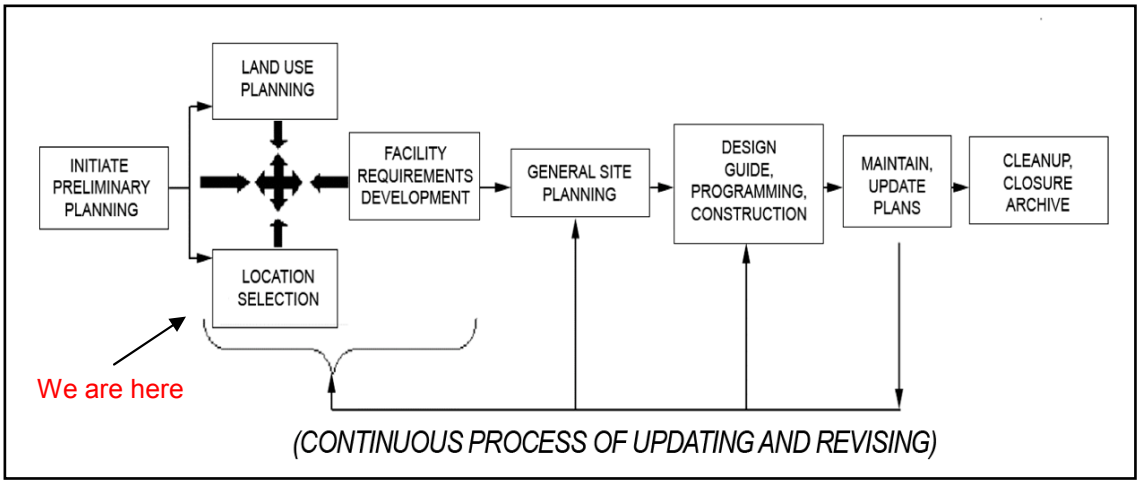

Figure 5-1. The base camp development planning process

b. The product of base camp location selection is the location selection record. The record consists of an executive summary and a detailed record that documents the analysis of possible site locations and allows commanders to make informed decisions regarding where base camp development will occur.

c. This step of the BCDP process, unlike any other step, may or may not be required. The following information shows selected examples of when location selection typically is and is not required:

(1) Examples of situations in which location selection will usually be required:

- A U.S. governmental department or agency determines a base camp is required.
- A HN identifies broad land areas to be used for a base camp.
- The U.S. government makes an agreement with a HN establishing contingency sites within the HN.

- A military situation has stabilized in a host (or a hostile) nation to a point that selecting potential base camp locations for U.S. forces and support activities is feasible.
- A HN requests U.S. assistance in planning and developing base camps.

(2) Even when the site of a base camp is fixed by other considerations, planners must highlight the ramifications of a "poor" site from an engineering viewpoint. Examples of situations in which location selection will often not be required:

- A HN designates, and the United States approves, a specific parcel of land for the United States to develop a base camp.
- The United States acquires adequate facilities from a HN for a mission.
- Specific strategic, operational, tactical, or technological requirements dictate a particular, predetermined location.
- The operational environment in the AO is unstable or poses a significant threat, and base camps for U.S. forces and support operations are primarily driven by tactical conditions (to include AT/FP considerations) and the urgency of the situation.

5-2. Location Selection Considerations. Because of the complexities of every military operation, each location selection undertaking is unique. The process and suggested practices contained in this chapter are based on detailed, multidisciplinary data. This guidance consists of optimums, ideals, approximations, and rules of thumb. It is not intended as precise and prescriptive criteria. It should be kept in mind that the suggested practices and data should be used only for general planning purposes. Adjustments must be made to suit the uniqueness of each situation. However, there are some basic guidelines that apply to every location selection process. Those guidelines include the following:

a. The quality of the final selection of a base camp location is a function of the number of potential base camp locations considered. Each location will have met the goals and the minimum criteria for mission, AT/FP, tactical suitability, general adequacy, and any other requirements dictated by the commander. A thorough map reconnaissance using maps or remote sensing output is an essential first step of the process. All possible geospatial and intelligence products available should be included in the planning process. This can provide the team with a number of potential base camp locations to visit during deployment.

b. Every location selection team should be carefully tailored to fit the situation. For example, if the threat of terrorism is high, then AT/FP experts should be on the team. If there is a shortage of water in the HN, then water resources specialists should be present. If extensive aviation operations are planned or under way, airfield operations, aeronautical services, and runway pavement experts should be either members of the team or close at hand on a reachback basis.

c. Thorough research and preparation before deployment provides the knowledge base needed for the efficient accomplishment of field work. Of equal importance is obtaining and providing the travel funding, diplomatic and legal clearances, administrative support, logistical supplies and services, equipment, and adequate dining and lodging arrangements for deploying members of the team.

d. The location selection process is enhanced by intensive and detailed surveys. Time spent "on the ground" conducting rigorous surveys and optimizing USACE reachback capabilities will assist in preventing surprises and improve the quality of the data used to determine the "best" location.

e. The theater command must be involved and informed throughout the entire location selection process. A liaison representative/planner from the FFE team is an excellent channel for the location selection team to use in coordinating with the combatant command and/or the theater command staff. See FM 3-34 for a doctrinal discussion of FFE.

f. The U.S. DOS should also be involved and informed throughout the process. A multitude of factors involving diplomatic procedures and international law must be considered when the United States initiates and maintains a presence in a HN.

g. When the HN government and social structure are functional, appropriate coordination through the DOS representative with HN representatives will enhance the location selection process. DOS representatives will know the HN and the local environment and understand how its government operates; they can be a great source of assistance and advice, and can expedite the work of a location selection team and/or the process. Coordination with HN representatives typically eliminates many unknowns, thus ensuring that the planning process proceeds.

5-3. The Interrelationship Between the United States and the Host Nation. The magnitude of the role of the United States and its interrelationship with the HN in base camp location selection is often based on the result of the analysis of the operational variables (see Chapter 4 of this pamphlet and FM 3-0).

a. In the case where the HN government is functional, the United States may be entering into a set of conditions where it is an invited guest and partner of the HN. In this case, U.S. presence will most likely be viewed by the HN as a distinct benefit. In this type of environment, the HN can assist the United States in achieving its particular goals and objectives.

(1) If the theater command has already established its presence in the HN, the HN is relatively stable, and FFE resources have been deployed, then the HN can potentially perform the following tasks or provide the following services relating to location selection:

- Coordinate with the theater command by designating one of its representatives, or a group of government officials, to work and negotiate with U.S. or multinational authorities. Ideally, the HN diplomatic representatives will work with DOS officials, while the HN military representatives, engineers, and planners will work with their U.S. counterparts in the theater command and on the location selection team.
- Identify solid examples of potential land areas and available facilities for U.S. use. HN engineers may be aware of geophysical requirements, material, design, and construction considerations that might not be readily apparent to the location selection team.
- Provide the theater command with detailed information and advice about HN laws, customs, and values, and other issues that can impact the analysis of the operational variables.
- Be a source of help in overcoming bureaucratic obstacles that might interfere with the base camp development planning mission such as entry and residency permits, duties and taxes on imported construction materials, use of the local national labor force, use of airspace, and transportation facilities.

(2) In some instances, the HN might provide a full range of services and support. This especially will be the case if the HN has a robust economy and if the HN is inviting the United States into its country to bolster its defense forces or provide other benefits. In several past instances, the HN paid all U.S. expenses associated with locating and developing permanent military installations. Although these installations were primarily for HN forces, agreements were reached whereby the United States could use them in support of a contingency operation. In other instances, the HN provided a full range of services but the United States paid for them.

(3) There will also be cases where base camp development will occur without the support of a theater command. However, the appropriate combatant command must be kept informed and given the opportunity to participate in the location selection process. For example, the United States might need to establish a storage site for pre-positioned war materiel, or it may need a strategic location to establish a base camp for high security operations or equipment. In such cases, the HN might perform functions similar to those in which a theater command is involved, to include the following examples:

- The HN will designate representatives to work and negotiate with U.S. authorities. In this case, U.S. representatives might consist of only a small location selection team, including a DOS official. In the absence of theater command involvement, the location selection team might consist of higher-ranking members due to the direct U.S.-HN working relationship. For example, in past cases when a theater command was not involved, teams consisted of Department of the Army (DA) personnel, HQUSACE personnel, and DOS Foreign Service Officers.
- The HN will designate potential land areas and existing facilities that might be used. First, the location selection team will assess the acceptability of these

areas and facilities. The team will then negotiate with the HN to obtain the required levels of tactical and AT/FP security along with necessary transportation, utilities, and quality-of-life support.

- As in the case of theater command involvement, the HN will be providing a full range of services and support especially in cases where the HN will jointly occupy the facilities along with U.S. forces.

b. The following applies when the HN will not have a functional government. The nature of military conflicts often results in a severely disrupted or disestablished HN government, economy, and social structure. In such situations, the U.S. military, using its civil affairs, engineering, and other capabilities, moves to restore security, essential services, and economic stability as quickly as possible. Base camp development planning will begin as soon as the mission is assigned.

(1) When a theater command is controlling operations, maneuver, civil affairs, military police (MP), and engineer units will typically provide security and stability. The theater commander or the Army Service component commander will typically make most of the decisions, including the selection of the final locations for base camps. When recovery begins, the civil affairs organization will take the lead in restoring the HN government, and the HN role in planning and decision making will increase over time. At this point, previously unknown issues might arise such as the requirement to locate military activities at prescribed distances away from religious facilities or cultural sites. Resolution of such issues might require the adjustment or relocation of certain base camp assets.

(2) In a contingency operation without the support of a theater command, HQUSACE will be working with the DOS and other agencies without the HN's participation in the initial stages of the process. However, the appropriate combatant command must be kept informed and given the opportunity to participate. As in the previous case, if the HN government is functional, its role in planning and decision making, as well as in the negotiation of use agreements with the United States, will become an integral part of the process. Examples of such a situation might include establishing camps for displaced persons, building EPW/detainee camps (in some cases, outside the country where operations are taking place), and establishing safe locations inside/outside of a TO for the storage of captured enemy munitions and other hazardous materials.

c. The OE will directly affect base camp development in terms of the types of facilities planned and constructed as well as the location selection process itself. One goal is to provide the healthiest and safest environment possible for U.S. forces and those who support the force. Therefore, the location selection process must collect and analyze as much information as possible about the HN, the region, and all natural and man-made forms, forces, and features that can affect U.S. presence.

(1) The size of the U.S. force has a direct impact on the scope and cost of the land, facilities, and physical infrastructure that will be required to support the mission. Additionally, the potential socioeconomic and cultural impact on the HN should be analyzed.

(2) The threat level to the United States, to include the potential for post-combat terrorism, guerrilla activity, and lawlessness, must be considered. As stated throughout this pamphlet, AT/FP is a top priority wherever U.S. forces are located. Examples include—

(a) A HN government offered the Army a first-class, sixteen-story hotel for housing deployed troops. The hotel was in a downtown area located adjacent to a four-lane, divided boulevard that connected with the HN's major airport, the government center, and nearby shopping districts. However, the building was designed with an open breezeway on the ground floor, a portion of which contained a driveway for arriving and departing guests, and access to an underground parking garage. The hotel's restaurant, offices, and fitness facilities, which were located on the second floor, overhung the breezeway for some 40-50 feet. AT/FP experts on the location selection team advised the team leader to request a different facility because of the hotel's vulnerability to terrorist attack.

(b) A location selection team was looking at alternative locations for a battalion-size FOB. The area was rural and the tactical environment was unstable. An area was selected that consisted of a broad valley through which a small river and a two-lane gravel-paved highway ran, with moderate to high hills on both sides of the valley. The engineer member of the location selection team recommended a location in the flat plain area, next to the highway, isolated from the river's flood zones. The team's Assistant Chief of Staff for Operations and Plans (G-3) however, had a very different opinion about where the operating base should be located. Although the site that the engineer recommended would facilitate efficient construction, the G-3 was concerned that enemy forces would occupy dominant terrain in the adjacent hills. From there, they could observe and fire upon the facility. To eliminate this tactical threat, the operations planner recommended locating the base camp on a dominant, nearby hill, between its military and topographic crests. It was thought that this location would be more challenging to develop, but immeasurably safer in the long term.

(3) The anticipated duration of the U.S. military presence will be influenced by some of the following elements:

(a) When a HN requests a sustained U.S. presence, the negotiation process with the HN usually results in the creation of a SOFA between the United States and the HN. The level of involvement of a location selection team in the development of a SOFA will vary depending on the situation. Alternatively, there may already be a SOFA, a treaty, a United Nations resolution, or another agreement in place before the team's arrival in country. In other situations, the team may have some involvement in negotiating and preparing such an agreement. The agreement may include—

- A description and list of the organizations, population numbers, locations, operational capabilities, and the purpose of the U.S. military personnel to be stationed in a HN.
- A summary of the various elements of support that the HN will provide to the in-country U.S. military force, how the United States will reimburse the HN for its support, how the United States will support its in-country military force, the channels of communication and diplomacy between the United States and the HN, and how the United States and the HN will interact on military matters.
- A plan of action that addresses how long U.S. forces will be stationed in the HN's territory. It may include a set of conditions and a timetable for the eventual departure of U.S. forces from the HN's territory. The agreement may identify the prior-to-U.S.-use and the desired end-state condition of lands and facilities used by the United States and what actions will be taken by the United States to clean up, close, restore, and return the HN's land and facilities when the United States departs.
- Specify certain policies and procedures governing how the United States will be required to treat HN cultural, political, religious, environmental, historic, and archeological matters.

(b) Based on past experience with U.S. overseas operations, use agreement documents for individual parcels of land or individual facilities are almost always required. This has even been the case in the high-threat and remote areas of a HN where active combat operations were occurring. The use agreement documents identify particular parcels of land, along with any existing facilities and improvements, which will be made available to the United States. Also, the agreements specify the condition and quality of the applicable lands and facilities when they are returned to the HN (when the U.S. mission ends). It is likely that the location selection team will be involved in the process of formulating use agreements and then negotiating them with the HN.

(c) It is extremely important that members of U.S. forces and those who support them learn and respect the laws and customs of the HN. For example, it may be forbidden to locate military facilities within certain distances of religious or educational facilities. Work may be forbidden on certain days of the week or at certain times during the day. The giving and receiving of gifts may be an essential social courtesy whenever visiting a HN citizen or group. There may be unmarked religious or cultural features that, unless carefully identified, might be unknowingly damaged and destroyed. HN law may require certain permits, duties, or inspection procedures for construction material and equipment that enters the country. Certain countries either permit or deny entry to visitors based on ethnicity, religious beliefs, gender, and other personal characteristics.

(d) U.S. construction and environmental standards might be very different from the HN standards. For example, in certain countries damage or destruction of even one small tree triggers an intricate liability and replacement process. Even the smallest building project passes through many layers of bureaucratic review before approval. In other

countries, water is guarded as closely as currency. Yet in other countries, sanitation and building standards do not come close to those of the United States. The location selection team should identify those standards and practices that will affect base camp development. If U.S. construction and environmental standards are higher than those of the HN, the U.S. standards will be observed in most cases.

5-4. General and Special Considerations. An array of general and special considerations must be taken into account once the location selection team enters the HN. If entry into the HN is not possible, the team should use all possible sources to analyze and evaluate the following considerations:

a. General considerations. There are two major areas of consideration that directly affect service members and others assigned to a base camp and determine if the planning for a base camp can be turned into reality.

(1) The security, health, and safety of U.S. personnel are primary considerations, and they are of equal importance in accomplishing the deployed strategic or tactical mission. Therefore, the first priority in base camp location and facility design includes operational, tactical, security, AT/FP, UXO, and health considerations. As in the examples given earlier, these considerations can lead a team to reject a modern hotel offered by the HN to house U.S. personnel because of vulnerability to threat activity or an otherwise excellent parcel of land that is ideal in terms of supporting construction might not be acceptable due to poor tactical security.

(2) Construction should be feasible in terms of construction time, costs, material availability, delivery and storage, access roads, site preparation, housing and support of construction personnel, and essential utility requirements. Also, the developed location should be capable of supporting a U.S. presence that might extend into an "enduring" phase (see Chapter 1).

b. Special considerations. Special consideration should be given to the following factors, some of which will impact on the first priority considerations stated above and others which will impact the quality of life of base camp users:

(1) Soils, foundation, slope and site drainage, flooding, and seismic conditions. These natural forces and influences are major determinants in location selection. In many cases, if these are unfavorable, a prospective location must be ruled out. Seismic conditions, in particular, in a HN have a strong influence on facility designs and construction costs.

(2) Water supply, sanitary sewage, and industrial waste disposal. These basic services are essential for sustained base camp support. In cases where these services are inadequate, the base camp planning should specify continuous upgrading of these services until they reach objective standards. For example, in the case of potable water, individually purified or bottled water will first be replaced by treated water from water

trailers, then water trailers will be replaced by treated and pipe-distributed water from local wells or streams.

(3) Power supply. A reliable source of electrical power is essential for base camp security, operations and maintenance, and quality of life. Planning should allow for continued upgrading of the power supply system.

(4) Environmental policies. Generally, when U.S. environmental policies are more stringent than those of the HN, the United States tries to observe its own standards. When the opposite is the case, the United States makes every effort to observe local standards. The location selection team must envision how and in what condition the land used for a base camp will be returned to the HN.

(5) Communications and information management. Successful mission accomplishment, as well as sound base camp operations and maintenance, require excellent, easily accessible, and up-to-date communications and information management tools. In some instances, the communications systems requirements will virtually dictate the location of a base camp to achieve operability of communications equipment.

(6) Health and medical. Evaluation of candidate locations for a base camp should exclude those with the presence of health hazards and include a plan to minimize the occurrence of new health hazards in the future. Rigorous provisions for adequate sanitation and medical care for base camp personnel must be a principal part of location selection planning.

(7) The local labor market. An adequate, skilled local labor force can perform many functions associated with base camp operations and maintenance with the benefit of freeing service members to perform their primary missions.

(8) Existing adequate and available facilities. Maximum use of existing adequate facilities will reduce the construction requirement and the time required to adequately house the base camp's assigned units.

(9) Sustainment training facilities for the deployed force. Deployed service members who are not in an active combat role must maintain their tactical skills and weapons proficiency. This becomes an absolute requirement if service members are in a deployed noncombat situation for more than three months.

(10) Coordination. If possible, coordinate each prospective base camp location selection possibility with the HN to verify that—

- It does not conflict with any HN operational or development plan.
- It complies with HN laws, regulations, policies, and programs.
- It does not conflict with HN cultural, sociological, political, religious, or historical infrastructure, facilities, rules, or customs.

- It meets with the requirements of U.S. and HN standards and agreements regarding eventual cleanup, closure, and return to the HN owner(s).

5-5. The Location Selection Team. This section explains the mission, organizational responsibilities, and possible scenarios for employing a location selection team. (See Appendix D, Table D-1 [pages D-1 through D-4], for a selection team checklist.) The mission of a location selection team is to search out and evaluate alternative locations for stationing U.S., HN, or multinational forces or other military-supported missions, such as disaster relief or the housing of dislocated populations. After evaluating the alternatives, the team recommends the most advantageous base camp location(s) for approval by the theater commander or other U.S. authority. If the military situation is relatively stable and U.S. and HN diplomatic negotiations are either underway or concluded, then the DOS will contact DOD and the location selection process will begin. If the situation is unstable, or if it involves base camp development in a hostile environment, then the team might consist of a forward engineer support team (FEST) under the sponsorship of a theater command. If the HN is in a geographical area where the USACE is the DOD construction agent, the combatant command or theater commander might task HQUSACE to support the location selection. USACE will provide this service either in support of or independent of the theater commander. When the service is provided independently, USACE will function either under the appropriate combatant command or, in rare instances, under direct DOD and Headquarters, Department of the Army (HQDA) supervision. If the proposed base camp is in a geographical area where NAVFAC or the U.S. Air Force (Air Force Civil Engineering Support Agency [AFCESA]) is the DOD construction agent, then DOD will coordinate the required guidance, task assignments, and execution arrangements among the departments. The organizational interrelationships between the departments are shown by Figure 5-2.

a. The USACE has the mission to advise and support the CCDRs by means of a liaison officer (LNO)-engineer planners located within these commands, and its deployed and reachback FFE capability. If selected and so directed by the command, USACE will plan, develop, design, and construct base camps in TOs within the DOD-designated geographic areas of the world for which it has construction agent responsibility. This mission includes planning for and preparing to execute location selection operations using its assigned military and civilian personnel and civilian contractor augmentees.

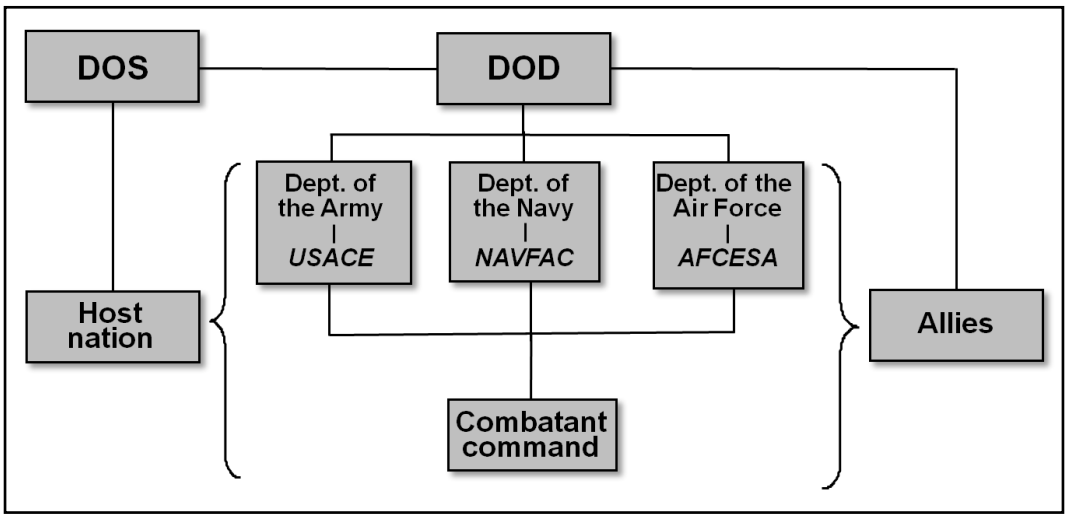

Figure 5-2. The organizational relationships of the location selection process

(1) HQUSACE either organizes a location selection team or assigns the responsibility to an established FEST from one of its district offices. The former might occur in the rare instances when USACE works under direct DOS-DOD-HQDA supervision, and the latter typically occurs when USACE is tasked to support a command deployed in theater. In the latter case, the FEST will first coordinate with the appropriate combatant or joint command LNO/planner at the command headquarters. Then, under combatant command sponsorship, it will travel to the HN. The Engineering Infrastructure and Intelligence Reachback Center (EI2RC) will provide reachback support to the deployed FEST.

(2) Once the location selection process is complete and the decision has been made to establish one or more base camps or support facilities, USACE divisions and districts are prepared to manage the construction of a base camp, or a series of base camps, within their assigned operational areas. Base camp construction projects will be planned and executed by the districts using either their internal engineering and construction contracting capabilities or relying on agencies such as the Joint Contracting Command (JCC) or the Defense Contract Management Agency for the preparation and management of contracts.

b. The location selection team is normally set up and led by a person of sufficient rank and position to enable effective coordination, obtain sufficient command visibility, and affect unimpeded access to the HN government and the HN at large. The U.S. military headquarters that establishes the team also provides or arranges for administrative and other types of support.

(1) When location selection is performed independently of combatant command leadership and participation, such as may be the case in a disaster relief or recovery operation, a senior USACE representative may be appointed as the team leader. In certain other instances, DOS or DOD officials might head the team.

(2) The leader's initial task is to tailor the team's membership to the situation and mission by selecting and appointing team members that represent the proper mix of experience, professional disciplines, and appropriate areas of expertise. Some members will be military personnel and some will be DA civilians or civilian contractors. Depending on the types of expertise, ranks, and civilian grade levels appropriate to the mission, the USACE team members will be from USACE district offices, with augmentation, if needed, from Headquarters USACE and USACE division offices.

(3) Another duty of the location selection team leader is to determine which team members will deploy and which will remain at home station. For example, the team's logistical support base is more effective if it remains close to a source of supply and procurement, assuming it has access to reliable and efficient transport and delivery. On the other hand, experienced planners, site designers, AT/FP, and tactical operations experts need to see and walk prospective base camp locations in order to maximize their contribution to mission accomplishment. Integration of a medical and other nonengineer expertise may be a requirement.

(4) Depending on the situation, the location selection team might include personnel from other U.S. agencies such as the DOS and, in some cases, personnel from allied or coalition governments. As mentioned previously, the team leader may decide to include HN representatives as team members or have them interact closely with the team.

c. The following twelve fundamental considerations relating to preliminary details will contribute to the success of the location selection team:

(1) Ensure that each team member procures the necessary documents. With the assistance of the DOS and the guidance contained at the HQUSACE Predeployment Website, team members must procure the necessary passports, visas, HN entry, and other theater clearance documents. The military status of the team members must be identified and clarified so that the team members will be afforded Geneva Convention rights in any situation regarding contact with hostile forces.

(2) Ensure that each team member meets health and immunization requirements. A physical examination will be conducted of each potential team member to determine his/her suitability and risk level, and immunizations will be brought up-to-date. Arrangements should also be made for in-country medical care and medical evacuation in the event of injury or illness.

(3) Verify security clearances in those cases where clearances are required. This is a key issue under certain circumstances such as when a base camp is needed to support classified operations.

(4) Ensure that deploying team members complete any required theater orientation training. For example, in previous years, both military and civilian personnel supporting operations in Bosnia and Afghanistan were required to complete theater orientation

training before being allowed to enter the countries. If the situation demands, the team should be provided weapons training; however, they are most often accompanied by armed U.S. and HN military personnel and are not issued weapons.

(5) After ensuring the availability and presence of adequate mission funding, make suitable travel, lodging, and other support arrangements, such as housekeeping and laundry service. The deploying and reachback team members handling logistical support should respond to requests from deployed team members as expeditiously as allowed to get supplies and equipment sent to the team. This can include making some in-country currency arrangements so that the team has access to additional cash if needed.

(6) Ensure that one or two team members are assigned as deploying and reachback field office coordinators to obtain administrative supplies and provide support. They will perform such tasks as sorting and filing data, ensuring that automation equipment functions properly, and making repairs and adjustments as needed. They will perform data entry tasks, handle review comments and their adjudication, ensure that team members have adequate working supplies, prepare orders and correspondence, make reservations and arrange schedules, and serve as "24/7" points of contact (POCs) for administrative matters. This task will also include publishing military uniform and civilian clothing guidelines; procuring badges; and preparing HN letters of invitation, introduction, and authorization.

(7) Procure and test all communications and management information systems before deployment. The availability of excellent, state-of-the-art systems that operate on near-real time basis and software applications common to all team members is vital to the reachback operation. Employment of multiple and redundant communications and media systems is often advantageous to team operations. Some examples are Internet, word processing, voice recording, satellite phone and data transmission, digital graphics, video teleconferencing, photography, and real time streaming video. However, all of these systems and communications should be thoroughly tested, and items such as spares and power converters should be procured before the team deploys.

(8) Determine the protocol, sequence, and types of in-country contacts and visits. There are usually more formal calls, briefings, meetings, and contacts required than originally anticipated. These and other protocols should be identified, scheduled, and attended (by the applicable team members).

(9) Coordinate arrival, departure, and visits with U.S. diplomatic and military representatives present in the HN.

(10) Ensure that all team members have working level competency with a common set of automation applications (of the same version) that will be used by all of the team members. Expedite automation training for team members if needed.

(11) Organize and make preliminary work assignments to the team members so that each person knows what is going to be required while in country or while functioning in a reachback capacity.

(12) Analyze and plan what information the team is going to collect, how it will be obtained, and in what formats it will be assembled. Make special arrangements for shipping bulky material such as engineering drawings, books, manuals, and maps.

d. Because the location selection process primarily deals with evaluating land, facilities, and infrastructure, a location selection task is normally assigned to, organized, and executed under the supervision of an engineer. However, the contribution made by engineers and planners represents only one segment of the team effort. Experts in many fields other than engineering are needed for a successful team effort and to assist with analyzing and formulating recommendations. A location selection team might include experts in—

(1) International and diplomatic relations. DOS liaison representatives and DOS Foreign Service Officers are very familiar with the countries in which they serve and can provide a valuable link between the HN government and location selection team. Often, they speak the language and are familiar with local government officials, laws, politics, customs, and religious practices.

(2) Military operations and training (Joint Staff Operations Directorate [J-3], G-3, and S-3 officers). The "tactical valley" example, cited previously, demonstrates the value of having operational planners on the team. Often the most constructible or accessible locations have severe tactical vulnerabilities immediately apparent to an operational planner.

(3) Antiterrorism and force protection. An AT/FP expert is an essential member of the location selection team. The "16-story hotel" example given previously demonstrates the need for such expertise.

(4) Medical and dental services. Team members can very easily develop health problems or sustain injuries while deployed to a HN. The team should include, or have access to, a nurse or Army health care specialist. If required, the team might include a physician. The type of medical expertise required in the performance of an EHSA may also be desirable.

(5) Civil affairs. Recent events in Afghanistan and Iraq demonstrate the essential nature of a civil affairs mission. Often, a HN is initially without essential services, a government, or security. A civil affairs representative on the team, who (ideally) speaks the local language, can assist in defining the civil affairs issues associated with the development of base camps. Examples include assisting the HN in forming or restoring government organizations; assessing the technical skills, availability, and training requirements for the HN's labor force; determining the requirements for law enforcement

and property security; reestablishing essential services and infrastructure; and setting up mechanisms to resolve HN claims against the United States.

(6) Real estate. Arranging for the use of land and facilities in a HN by the United States is not a simple matter. Skilled real estate appraisers and negotiators are required to ensure that the United States obtains the proper facilities at a fair price. Also, as an integral part of the initial land use agreement, the real estate team members will negotiate the objective end-state of the facilities to be used by U.S. personnel. A basic goal for every land use agreement is for the United States to return the land and facilities to the HN at the conclusion of the U.S. mission in the same condition that they were before the United States acquired them. Therefore, determining the condition of the land before the United States takes possession is vital. The EBS can assist in accomplishing this task; however, it must be understood that in some cases, returning land and facilities to the HN in its original condition is not possible.

(7) Legal issues. In the past, location selection teams were limited in their legal capability because their attorneys were familiar only with U.S. real estate and contract law. To correct this limitation, it is recommended that the team include attorneys who have experience with international law (see FM 27-10). Legal issues such as import duties and taxes, personnel and equipment entry documents, residency permits, the Geneva Convention status of U.S. nonmilitary personnel, policies on the use of imported vice local construction materials, and the employment of the local labor force require legal negotiation, agreement, and documentation.

(8) Cost estimating. While it is not necessary to have a contract (final) cost estimator on the location selection team, an order-of-magnitude estimator is essential. Cost issues usually arise at the very beginning of negotiations with a HN government. Automation tools provide great assistance in preparing preliminary cost estimates, but an experienced estimator will often see things not readily apparent to others. One example might be the estimated increase in design and construction costs for a base camp located in a seismic zone. Another example might be the increased base camp construction costs connected with the removal of unmapped explosive hazards.

(9) Military police operations. MP representatives on the team will promote the location selection process by evaluating the proposed site's vulnerabilities to criminal activity. They could also assist in identifying ground traffic control considerations and provide insight as to the interaction with the HN constabulary agencies. If the site is to be used for I/R, it is essential that one or more of the team members have the necessary expertise to support this.

(10) Transportation planning. This area covers all modes and methods of moving U.S. personnel, equipment, and construction materials to the proposed base camp location in a HN. This and other areas may require members on the team, or other related elements, to perform selected infrastructure reconnaissance operations (see FM 3-34.170). Experts in some of the following areas may be team members:

(a) Ports and navigation. Most heavy equipment and imported construction materials will arrive by water. A ports and navigation expert on the team can assess the capability of the HN's ports and other water navigation assets to accommodate the mission.

(b) Airports and airfields. Even if initial planning guidance does not call for aviation facilities, it is virtually certain that at least some of them eventually will be required. The possibilities for aviation support range from a simple helipad for C2 and supply delivery helicopters to an airfield that will accommodate large Air Force cargo aircraft such as the C-5A. Air traffic control, refueling, and field maintenance facilities are a part of such mission requirements. Airfield planning, aeronautical support, and pavement evaluation specialists can identify these requirements and make arrangements for the many special reviews and approvals that may be required for aviation facilities.

(c) Roads, bridges, and highways. As mentioned previously, the HN's infrastructure may be damaged by recent or ongoing combat operations, or it may lack maintenance or be primitive in construction. Civil engineers with expertise in pavements, highways, storm drainage, and bridges can identify the necessary repairs or construction to make these assets capable of supporting a base camp.

(d) Railroads. In some countries, railroads are the only reliable means of ground transport for significant numbers of personnel, heavy equipment, supplies, and construction materials. Civil engineers with specialized knowledge and experience in railroads can identify rail capabilities as well as the construction and repair requirements needed to support base camp development and operation.

(11) Information technology and communications. The ability to locate, share, and transmit information has become a basic warfighting requirement and is absolutely vital to the planning, development, supply, and operation of base camps. The FFE concept relies on excellent communications to expedite the process. Excellent communications requires adequate operational, well-maintained, accessible, and regularly upgraded equipment. An information technology and communications expert can examine the situation in a HN and identify what exists and what is needed to achieve and maintain information management and communications excellence.

(12) Environmental issues. An environmental expert (environmental support team [EnvST], the United States Army Center for Health Promotion and Preventive medicine [USACHPPM] environmentalist, or engineering staff environmental engineer) is an essential member of the team. Such an expert can identify, at the very beginning of the location selection process, the impact that base camp development and operation will have on the HN's natural and man-made features and can recommend ways to avoid, reduce, and mitigate adverse impacts. Oftentimes, they are the ones that complete the EBS and related EHSA before U.S. occupancy and development. Environmental experts are also essential for identifying how the land and facilities used by U.S. forces will be returned to HN control when a U.S. presence is no longer needed or required.

(13) Procurement and contracting. This member of the team should have knowledge and experience in U.S. procedures as well as those of the HN or similar countries. Location selection may be influenced by the proximity of a local labor force and HN contract laws and regulations. Procurement lead time for certain critical equipment and materials may have similar influences.

(14) HN sociological, political, cultural, and religious characteristics. The purpose of such expertise on the location selection team is primarily to prevent U.S. decisions from unknowingly ignoring, disrupting, or offending the government and the populace of the HN and, in some cases, members of allied or coalition military forces. Sometimes the DOS or civil affairs representatives discussed above can provide this important input to the decision-making process.

(15) Morale, welfare, and recreation. Personnel assigned to or using a base camp must be provided with sufficient MWR facilities and activities for off-duty enjoyment. Recreational facilities may exist in the HN that can be used by U.S. personnel. Alternatively, a relatively complete array of MWR facilities might be needed at the base camp. Such facilities, including facilities for personal communications with family members back home, help offset some of the hardships involved in a deployed status. An MWR expert can identify the proper mix of facilities needed for MWR support of the mission and might provide suggestions for positive interaction between U.S. personnel and the HN populace by means of shared recreational facilities and shared participation in public events.

(16) Real property management, maintenance, and repair. Experts in base camp operation and maintenance will have a strong influence on location selection. Members of the 412th and 416th Theater Engineer Commands are skilled engineers especially trained in managing and contracting the operation and sustainment of base camps. Similar expertise is resident in other Services as well (see FM 3-34 and JP 3-34).

(17) Various special services related to the HN. Many of the previously discussed areas of expertise have stressed the need for a positive interaction with the HN. In certain instances, particularly if the military situation is relatively stable, it can be advantageous to have an official of the HN government on the location selection team. This representative will be a constant source of guidance regarding the impact of a base camp location on the HN populace, including HN social, cultural, and religious values and HN capabilities to support and interact with the U.S. presence.

(18) U.S. military security personnel. In marginally stable situations, or in cases with a high threat of terrorist activity, U.S. military support personnel might be attached to the team to provide security.

e. Figure 5-3, page 5-18, shows how a location selection team might be organized. The entire array of functions shown is meant to show the possible range of expertise that might be needed. The mission will determine the actual team composition. Most likely,

an actual location selection team will have far fewer members than shown in Figure 5-3. Some of the members depicted in Figure 5-3 will deploy and others, probably the majority, will function in a reachback capacity.

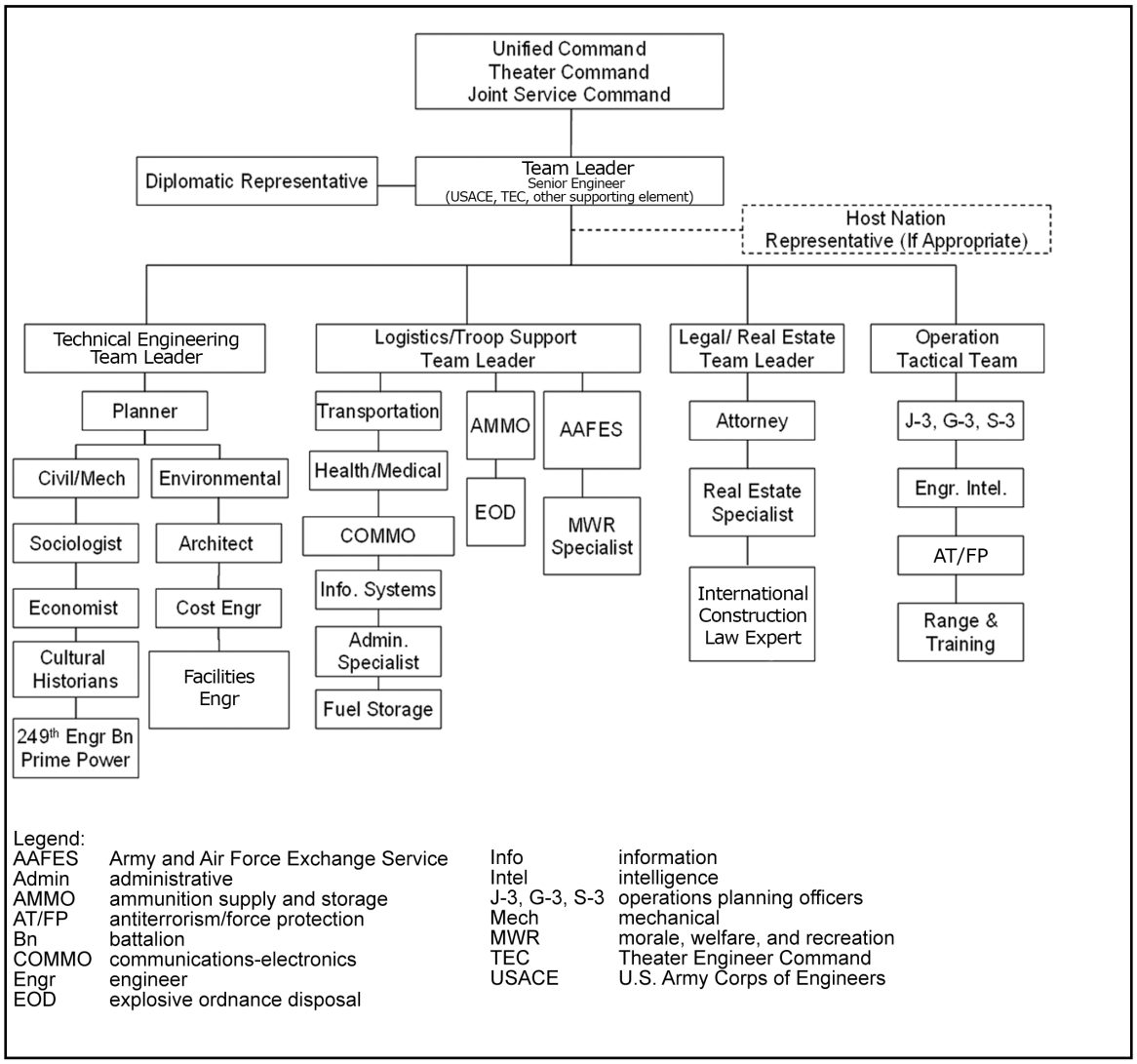

Figure 5-3. Possible location selection team members

5-6. Acquiring and Managing Location Selection Information. Gathering preliminary planning information involves thinking through the mission set of problems. Planners must then decide what information should be collected before deploying to the HN and what information should wait to be collected after deployment to the HN. The team initially meets to assign tasks regarding the fundamental details stated previously. Respective members are assigned tasks for collecting and analyzing information about the mission to be supported, the HN, and prospective base camp locations. Typical products and sources of information that should be collected are shown in Appendix D, Table D-2 (page D-4).

a. Collecting planning information involves assembling, evaluating, and studying as much relevant information as possible before the team deploys. Make maximum use of electronic documents and automated files in formats readily accessible to all members of the team. The following steps are helpful in collecting information before deployment:

(1) Collect the most accessible information first to help determine what information must be collected later.

(2) Use caution in limiting the quantity and types of information to be collected in the preliminary stages of location selection.

(3) Let the appropriate location selection team members take the lead in deciding what information should be collected.

(4) "Triage" information into what is essential, what may have value, and what should be discarded.

(5) Interpret information. Team members will collect and analyze as much data as possible in their respective areas of expertise.

(6) After collection and initial analysis, conduct working sessions in advance of deploying to the HN.

(7) After respective team members present the information they have collected, the team leader determines which information is relevant and applicable to the location selection operation. Figure 5-4, page 5-20, shows an example of how to analyze and evaluate the initial information gained during the location selection step.

(8) The team leader determines those areas where more information should be sought or requires further study. Table 5-1, page 5-20, shows the data management process.

b. Information must be properly managed, compiled and organized so that—

(1) Its source is clearly recorded (marked with the date, contact information regarding the source, and the venue in which the information was obtained such as phone call, meeting, interview, internet, remote sensing, library, or document research).

(2) It is in a format that allows updating or expansion (this relates to the common software mentioned previously in this section). File structures for storage and retrieval of information should also be common, relatively intuitive, and familiar to all members of the team.

(3) Any individual piece of information can be readily compared to related data (easily linked with, queried, and interactive with related data when applicable). Database software, such as MS Access®, offers such a capability.

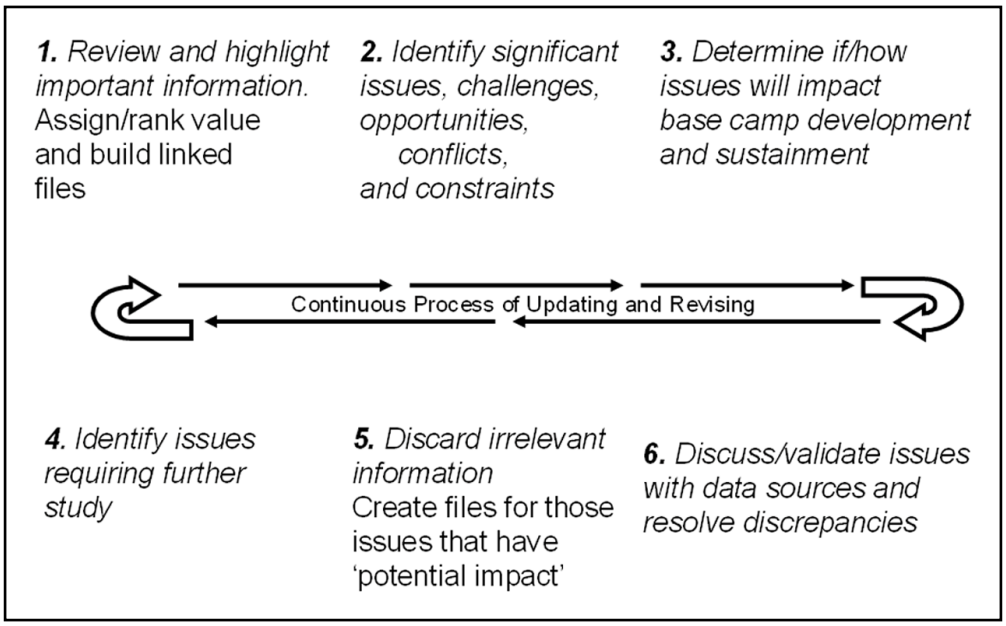

Figure 5-4. Information analysis and evaluation

Table 5-1. Data management

Data Management Process
1. Each team member manages a specific data area.
2. Team working sessions determine the relevance of various data elements.
3. Irrelevant data is discarded.
4. Potentially important data is maintained.
5. Data and data sources are verified.
6. Discrepancies are identified and resolved.
7. Data is rank ordered, based on its usefulness.

c. The proof of good data management is the ability to quickly answer questions such as: Who gave you that information? When/how was that decided? Where did you get that? and Where's the criteria or standard for that? It's almost certain that such questions will arise during briefings to various command groups, other U.S. agencies, and HN representatives.

5-7. The Location Selection Process (In Country). This paragraph describes typical actions that a location team will accomplish during the deployed phase of the task. It

should be understood that each mission and situation will require some variation to the procedures described here.

a. Upon arrival in the HN, the team will—

(1) Make contact with the DOS and HN representatives. Ideally, this should occur immediately upon the team's arrival in the HN, such as a phone call from the point of entry to the designated POCs who will come to the point of entry to meet the team.

(2) Check communications with team members who remain in the United States or at the headquarters from which the team deployed. If something doesn't function properly, it should be corrected before the team begins examining prospective base camp locations.

(3) Perform any required entrance and exit briefings, courtesy calls, meetings, or visits. There are usually more of these than originally anticipated. Concise, informative, and courteous information briefings can enhance HN and local command cooperation with the fieldwork. If necessary, ensure that high quality interpreters are available.

(4) Secure and verify the adequacy of lodging and various aspects of support such as dining, laundry, health care, housekeeping, supplies, and required documentation, and arrange scheduling, security, and transportation for the inspection of prospective locations. As discussed previously, good team performance depends on the team leader taking good care of team members.

b. While in the HN, the team objectives are to—

(1) Visually inspect prospective locations by walking or driving over each land area under consideration, immediately ruling out locations that will not support the mission, and explaining why they are unacceptable.

(2) Negotiate with DOS and HN representatives, if necessary. This should include identification of the existing condition of the land areas to be used for the base camp as well as the expected condition to which these areas will be restored when U.S. use is terminated.

(3) Select one or more locations for U.S. base camps from among a number of solid alternative possibilities. A rule of thumb is to locate at least three acceptable alternative locations for one base camp before identifying and explaining the rationale for recommending the most advantageous COA or alternative. The advance collection of remote sensing data and the liberal use of video recordings at each alternative location will expedite this process.

(4) See and compile enough information to document the task with a location selection record (discussed in paragraph 5-8) upon which further decision making and

subsequent planning will be based. It is important to identify the rationale and measures needed to accomplish cleanup, closure, and restoration (or turnover) of the base camp when the U.S. presence is terminated.

5-8. The Location Selection Record. The location selection record is the formal record of the steps taken to coordinate, evaluate, and perform the location selection process. It is a basis for various land and facility use agreements between the United States and the HN and serves as a starting point for subsequent planning design. It provides commanders with information upon which to make base camp location decisions, but it must also look into the future and address eventual base camp cleanup, closure, and turnover concerns. It can contain more detailed planning information based on HN requests to perform additional planning tasks such as estimating the cost of construction, illustrating preliminary facility designs, and estimating HN labor force requirements. The contents of the location selection record may include written, recorded, photographic, graphic, database, and video graphic information addressing the general and special considerations discussed previously. Appendix D, Tables D-3 and D-4 (pages D-5 through D-24), contains an example of a comprehensive format for the location selection records (executive summary and detailed record). However, the format may vary depending on the actual situation. The record should include—

- A general introduction. This section will consist of an executive summary, a summary of the mission statement, a description of the process that was used in the field to survey, and a recommendation of the most advantageous base camp location(s).
- A description of the HN. The geographic, demographic, socioeconomic, cultural, and religious aspects of the HN population will be described in this section.
- An analysis of AT/FP factors, along with other factors that affect the security of persons and property, that influence the recommended base camp location(s).
- A description of the recommended base camp location(s), areas, and boundaries.
- The climatological and meteorological conditions of the HN. In addition to weather data, other conditions, such as seismic vulnerability, will be included in this section.
- A real estate section. In addition to describing the pending and concluded real estate agreements made with the HN, this section will identify the base camp cleanup and closure objectives for the time when U.S. presence is expected to end. For example, if the land to be occupied by the base camp is a farmer's cattle grazing land, the objective upon cleanup and closure will be to return that land to good grazing quality or other use agreeable to the owner.
- A regional factors section. This section will relate broad HN demographic, social, economic, cultural, and religious traditions, behaviors, and preferences to specific examples that exist in the region where the location selection process is being undertaken, such as in the case of locations of religious

facilities, cemeteries, educational institutions, mercantile centers, and industry. Also, this section will discuss the local labor market in terms of its capability to support U.S. construction, base operations functions, and administrative functions.

- A section containing the EBS (ideally supported by a companion EHSA). The EBS describes the condition of the land and real property chosen for development of a base camp, ideally before occupancy or construction takes place. Therefore, the EBS identifies the preoccupation environmental conditions for the protection of troop health and safety and pre-existing environmental conditions that protect U.S. interests from spurious claims at closure. It also establishes an objective end state to which the land area must be restored. Coordination with the theater command's environmental management officer during location selection will minimize future challenges and claims. The EBS will be conducted by the environmental management officer, expert members of the location selection team, other engineer representatives, or as contracted by the theater command. Either the location selection team leader or the prospective base camp commander will ensure that copies of the EBS are forwarded to the theater command's engineer and to the officer assigned to handle legal claims against the United States. A comprehensive EBS includes—
    - A precise, illustrated and mapped description of the location including present land uses and conditions, health and safety conditions, and the objective end state to which the land area must be restored at base camp cleanup and closure.
    - A description and mapping of observed spills or soil staining.
    - The present and recommended methods of sanitary waste disposal.
    - The recommended methods of water supply and discharge.
    - Recommendations regarding HW/infectious waste collection and disposal.
    - A description and mapping of any underground and above ground storage tanks.
    - A description and mapping of drums and containers of HW.
    - Any additional aspects deemed to be significant to existing baseline conditions.
- An estimated water consumption section. This section will estimate the requirements for water consumption from a low-end, austere "initial" condition to a high-end, fully developed base camp condition.
- A sewage and waste disposal section. This section will describe the facilities and approaches recommended for sewage and waste disposal requirements from the low-end to the high-end state of conditions.
- An air pollution control section. This section will address the matter of attaining and maintaining favorable air quality standards for the base camp and the surrounding HN region. Also, this section can describe any agreements reached between the United States and the HN regarding measures to control air pollution in the area of the base camp.

- A transportation facilities section. This section will describe the HN, regional, and local transportation network; it will provide an estimate of the transportation system's capacity and a summary of relevant problems that require attention. It will evaluate roads and bridges for wheeled- and tracked-vehicle access, railroads, waterways, and air transportation. It will also provide information and analysis regarding a potential aviation component for each potential location selection site. Aviation requirements can span from helipads for command, control, and resupply helicopters all the way to operational and supporting facilities for U.S. Air Force cargo and combat aircraft.
- A traffic control section. The MP member and the transportation planner member of the location selection team will prepare this section by describing the capacities, chokepoints, tactical and AT/FP vulnerabilities, and engineering deficiencies that require attention.
- A drainage and erosion control section. Planning for base camp drainage must be an integral part of the location selection task. Adverse drainage conditions not only affect the health of base camp occupants; it also affects trafficability, equipment readiness, and morale. This section will address those concerns.
- A power and fuels section. This section will identify sets of estimated demands for austere operation (initial) and the methods recommended to meet these demands, followed by demands that will result from improvement of the base camp's facilities and infrastructure (organic to permanent, if applicable).
- A communications and information management section. This aspect of the infrastructure has become an absolute requirement for U.S. forces from the initial phases of a mission to its completion.
- A conclusions and recommendations section. This section will explain, in detail, the process used to arrive at the recommended location. Alternative locations that were considered will be described and compared to each other, and the candidate locations will be listed in order of merit. Significant shortfalls and vulnerabilities will be described, as well as subsequent planning needed to follow the location selection process. The requirements for eventual base camp and copies of U.S. and HN agreements will also be included.
- A list of exhibits. Examples of these exhibits include maps, photographs, digital video recordings, memoranda of meetings and interviews, field notes, and copies of U.S. and HN agreements.

5-9. Review and Approval of the Location Selection Record. The review and approval process for the base camp facilities allowances will most likely consist of a series of information and decision briefings to command groups at appropriate levels. The approval granted will be recognized as being that of a preliminary approval of the facilities that might be required at the proposed base camp. In a typical situation, assuming that a theater command is in place, the review and approval chain likely will proceed from the base camp to the appropriate intermediate headquarters, to the theater command headquarters, and perhaps to HQDA. Special reviews and approvals, such as those required for aviation, munitions, and ranges and training facilities, will likely be

obtained or be underway before submitting the requirements document through the command approval chain. A typical flow of TO reviews and approval is shown in Figure 5-5. In this figure, the dotted lines represent coordination and information exchange that should be on-going, regardless of the review and approval process requirements. In special cases, there will be exceptional oversight, such as Executive Office, Cabinet level, or Congressional oversight of a plan to establish a base camp in a foreign country. In those instances, a planner may be asked to provide information beyond that which is customarily associated with the development of a base camp.

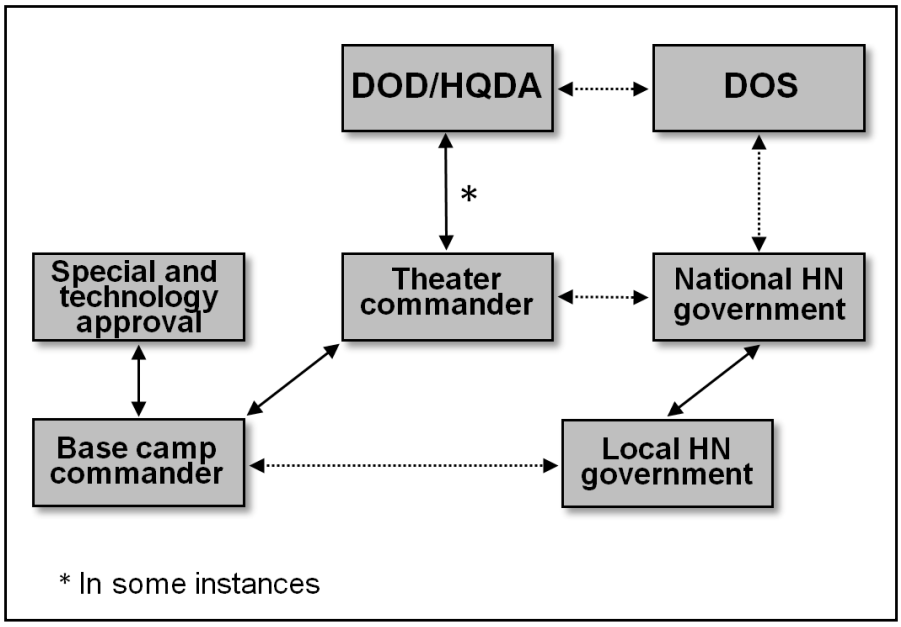

Figure 5-5. The flow of reviews and approvals

CHAPTER 6

Land Use Planning

6-1. Introduction. This chapter defines and describes the land use planning process which is the touchstone of the base camp development planning process (see Figure 6-1). The paragraphs contained herein explain how to prepare and obtain review and approval of the base camp land use plan and how this plan becomes the foundation of the base camp development plan.

a. *Land use planning* is defined as the process of calculating, mapping, and planning the allocation of land areas based on general use categories, mission analysis, functional requirements, functional interrelationships, standards, criteria, and guidelines.

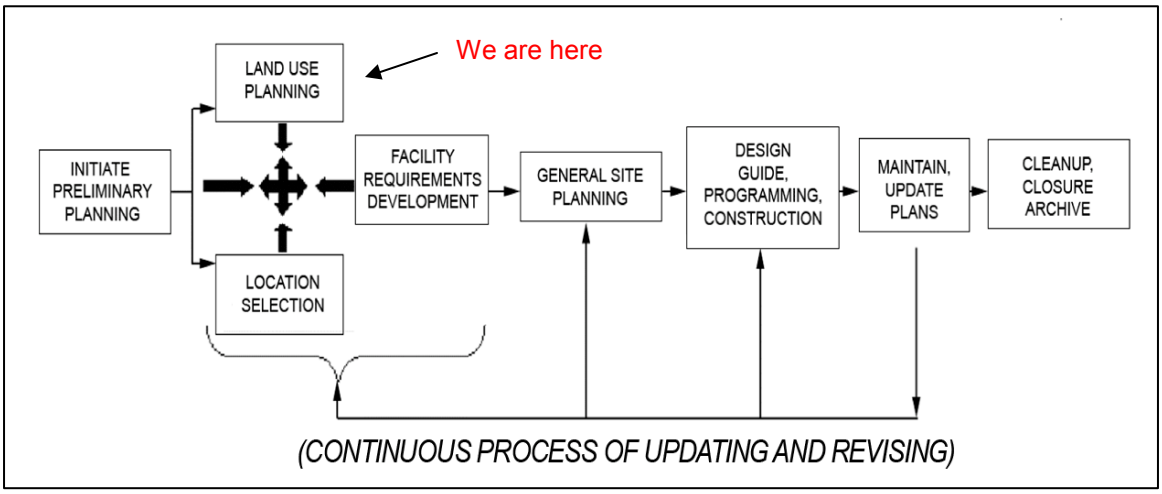

Figure 6-1. The base camp development planning process

b. Land use planning integrates the natural and man-made physical elements of a base camp and the human (military and sociocultural) activities that take place within and around it.

c. The physical appearance of a land use plan resembles an assembled jigsaw puzzle, because each piece of the plan (each representing a land use) is intended to fit together with the others to form a mutually supporting whole. The land use pattern accounts for constraints that cannot be overcome, takes advantage of opportunities that exist, accommodates existing requirements, and allows room for future expansion. Compatible land uses are placed close to each other and incompatible land uses are separated.

d. A land use plan depicts general locations for land use areas in relation to existing development patterns (all natural and man-made forms), forces, and features at the base camp location. They range from fairly elaborate plans to very simple plans, usually depending on resources (time, availability of software, and such) and the situation. See

Appendix E, Figures E-1 through E-3 (pages E-1 through E-3), for example land use plans.

e. A land use plan should show the basic scheme for main vehicular and rail networks and the locations most suitable to support air access. It should designate the most advantageous locations and alignments for the mains, the stations, and the plants associated with the utility systems. More detailed utility system alignments are addressed later in the planning process as part of the general site planning topic presented in Chapter 9.

6-2. The Land Use Planning Process. A land use plan is the product of collecting and analyzing data to include estimating land area requirements, performing environmental and functional analyses, and developing and comparing alternative schemes. Each alternative is a solid, logical solution to satisfying the requirements. After analyzing the alternatives, the planning team decides upon the most advantageous alternative, and then uses it as a basis for developing the proposed land use plan. This plan then becomes the base camp land use plan after command approval. The land use plan is the 'skeleton' upon which, and the ‘compartments’ within which, the development of the base camp will occur. If a land use plan is based on solid planning information and careful analysis, and is flexible enough to accommodate change and short-range issues, major revisions are rarely needed. (See Appendix E, Table E-1 [pages E-4 and E-5], for a sample land use plan checklist.) Many professional publications are devoted to the subject of land use planning. Here, the process is reduced to a series of twelve pragmatic steps that promote understanding, reduce complexity, and minimize the use of theoretical and technical language. While the process will be discussed in terms of steps, it really should be thought of as a cyclical, not linear, "start-to-finish" process. The process is analogous to a tailor making a suit of clothes for a customer. The tailor goes "back and forth" between the steps of the tailoring process—fitting, marking, altering, and refitting—to achieve a quality result. Later on, if the customer's size should change, the tailor goes back again and alters (but does not totally remake) the suit.

6-3. Steps for Land Use Planning. The steps in the land use planning process are listed below. Each will be discussed in subsequent paragraphs, along with suggested ways to accomplish each step.

- Collect information.
- Set land use goals and objectives.
- Calculate land area requirements.
- Conduct an environmental analysis.
- Prepare an environmental overlay.
- Conduct a functional analysis.
- Produce a functional relationship overlay.
- Develop alternative land use plans.
- Select the best alternative land use plan.
- Obtain the commander’s approval.

- Obtain higher headquarters approval.
- Implement and maintain the land use plan.

a. Collect information. This step involves the collection and data analysis/evaluation process that was discussed in Chapters 3 and 4. The information essential for the preparation of the land use plan would include the mission, population, and equipment data; an analysis of the HN information; the EBS (and EHSA if available); the TAB; as much imaging and map data about the location as can be obtained; and command and operational planner guidance and preferences (see Figure 6-2). One way to organize the collection task is to group the information into sets of planning factors as follows:

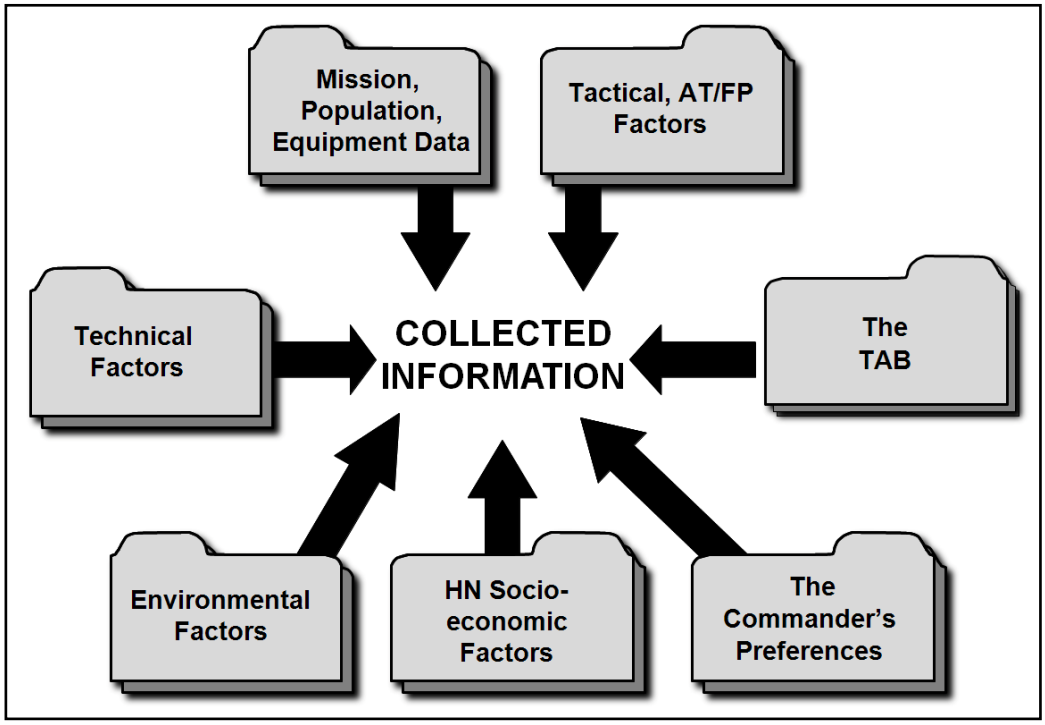

Figure 6-2. Data essential for successful base camp land use planning

(1) *Tactical and AT/FP operational factors*. A civil engineer might recommend a nearly level area as the best land upon which to construct the built-up areas of a base camp. However, if dominating terrain surrounds it, operational planners might determine this land to be tactically vulnerable and would recommend against constructing a base camp in that location.

(2) *Environmental factors*. These factors include both natural and man-made features that affect the location. Environmental factors (depicted on the environmental overlay) are constraints influencing the environmental impact of the development and operation of a base camp. Each constraint varies in impact depending on the land use category. For example, a floodplain area is not suitable for heavily developed uses but

may be used as open space, clearance zones, buffers, or outdoor training and recreation. The noise zones around an airfield are not suitable for housing, but might be used for industrial, maintenance, or noise-producing training activities.

(3) *Technical factors*. Base camp development planning requires the consideration of a vast number of technical factors. Many of these factors are not immediately visible at the time of a ground survey; they include such factors as geologic sinks or weak soil structure, seismic zones, catastrophically severe weather, electromagnetic radiation zones, aircraft flight corridors, and accident potential zones. The need to deal with technical factors could also arise when new, larger, or more lethal weapons systems are introduced if such new weapons would require sustainment training at a base camp's firing ranges.

(4) *Socioeconomic factors*. Socioeconomic factors influence the development of a realistic plan. Social factors include the accommodation of HN laws, regulations, politics, customs, and religious considerations. Economic factors include the amount and availability of U.S. funds to develop the base camp as well as the effect that the U.S. presence has on the HN economy. These may lead to trade-offs between what is most ideal, what is most expedient, what is most realistic, and what is most respectful of the HN preferences. An example of this occurred when a poultry farmer contacted a local commander and complained that low altitude helicopter flights had caused his chickens to stop producing eggs. The command had unknowingly aligned a low altitude flight corridor right over the farm. Realignment of the corridor resolved the complaint and ensured the farmer a continued livelihood.

b. Set land use goals and objectives. This step involves mapping out a strategy for the land use plan. Questions to be answered include—what should the plan accomplish, what opportunities and constraints should be addressed and, most importantly, exactly how will the land use plan support and enhance mission accomplishment. To assist in the task of setting goals and objectives, the following set of definitions applicable to goal setting is provided:

(1) *Goal.* A desired outcome, not necessarily quantifiable; a valuable target for planning.

(2) *Objective*. A more specific component of a goal, usually quantifiable and sometimes linked to a schedule or time line. Objectives are used to measure progress toward a goal. (See Appendix E, Figure E-4 [page E-6], for an example of goals and objectives for a land use plan.)

c. Calculate land area requirements. Calculating land area requirements is a task that establishes the scope or size of the land use plan. Specifically, it estimates the required minimum size of each land use zone based upon the size of the unit, mission, requirements, and other factors identified during the mission analysis. (See Appendix E, Table E-2 [page E-7], for general land use planning factors.) Typically, an expansion

factor to accommodate both known and unknown future expansions of the base camp is added to the applicable zones.

(1) The planning team can use a TAB (see Chapter 7 for more information) as a technique to plan, calculate, and document the estimated land area requirements for each facility requirement.

(2) In the process of calculating land area requirements, one question that the planning team must keep in mind is, “Is there enough area within this land use zone to accommodate everything, plus room for expansion?” The Army changes at a much faster pace than many comparable large organizations in the civilian sector. In a TO situation, the tempo of change is even more accelerated. A sound land use plan must leave room to accommodate such changes for both anticipated and potential contingency missions. The following paragraphs discuss both forms of expansion planning.

(a) *Anticipated expansion*. An individual land use that has been designated by a land use plan should include a portion set aside to accommodate expansion. Base camps should be planned to accommodate expansion beyond current mission and population levels. For example, a two-BCT base camp might leave enough land area to accommodate a third BCT projected for deployment to the base camp at a later time. That additional expansion land may lie initially inside or outside of the established initial perimeter of the base camp depending upon a series of factors such as the availability of and potential for future land lease agreements and/or the likelihood of the additional commitment of forces.

(b) *Contingency expansion*. Land use zones should include sufficient area for expansion that might be required to support a new mission as well as unanticipated changes to the current mission. For example, a base camp may potentially have the mission to house large numbers of displaced persons. A degree of imagination and a solid mission analysis are used to anticipate the unexpected situations that can come to fruition in the future. Likewise, utilities and infrastructure support planned to accommodate the present mission should be slightly oversized to allow for expansion.

(3) Allow for anticipated and unanticipated expansion within land use areas. A commonly used rule of thumb in calculating land use area requirements is to first estimate the known facility and infrastructure requirements and mathematically compute the area; for example, acres or hectares, required to accommodate them. Then, add an arbitrary percentage to the result to arrive at the land use area requirement, including the expansion zone (see Figure 6-3, page 6-6).

(4) An example of visionary planning regarding contingency expansion occurred at a base camp that did not initially have an aviation mission assigned to it. However, the planning staff designated a large, open area, as "airfield" on the land use plan. Initially, the planners at higher headquarters questioned this apportionment of land, stating that no aviation mission had been assigned. The local planners responded with, "Yes, but we

know that many U.S. operations eventually requires aviation support." The higher headquarters allowed the "airfield" land use designation to remain on the plan. Soon after, the operational tempo increased dramatically and the base camp was ordered to construct a C-130-capable airstrip and provide the supporting facilities.

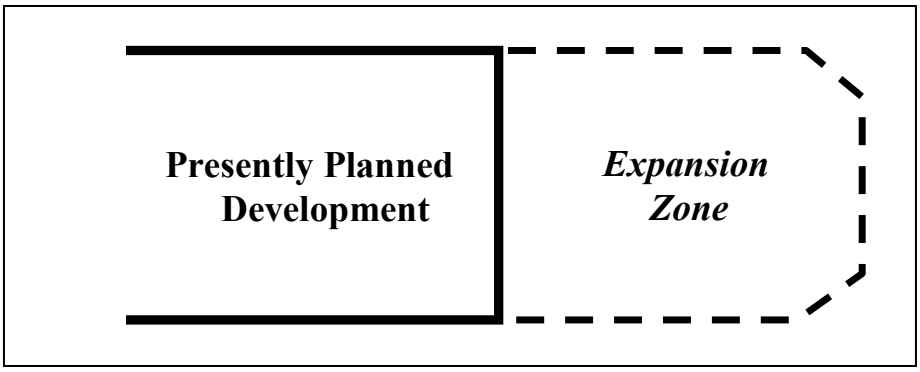

Figure 6-3. Planning for expansion

d. Conduct an environmental analysis. The environmental professional on the planning team, assisted by other members, should make a careful reconnaissance of the land area proposed for the base camp using the EBS (and ideally the associated EHSA) that was generated during the location selection step. This, along with other information, will be available in the location selection record. If appropriate, request the participation of knowledgeable HN government representatives, private citizens, and landowners.

(1) The objective of this analysis is to define the magnitude, significance, locations, and boundaries of all environmentally, socioculturally, or historically sensitive areas within or near the boundaries of the base camp. The written portion of this analysis will be added to the base camp development record. The graphic portion will be discussed in paragraph 6-3.e.

(2) Some of the environmental attributes and factors that the planning team should look for and analyze include—

- Safety and AT/FP clearance zones.
- Restricted areas.
- Airfield clearance zones.
- Noise.
- Topography.
- Floodplains.
- Wetlands.
- Soils.
- Threatened or endangered species.
- Contaminated sites, landfills, and hazardous/toxic waste.
- Water and wastewater treatment facilities.
- Surface water and groundwater (aquifer recharge areas).

- Electromagnetic transmission zones.
- Historical, archeological, cultural, and religious sites.
- Wind patterns and air pollution.
- Underground storage tank sites.
- Adjacent landowners and occupants.
- Open space/buffer areas.
- Seasonal constraints/restrictions.

e. Prepare an environmental overlay. Using a topographic map and the information taken from the environmental analysis, prepare a map overlay or computer-aided drafting and design (CADD) layer that graphically depicts the identified environmentally-sensitive attributes or factors. Mark these by labeling, boundary denoting, and location marking. It is especially important to mark the boundaries of those areas that, regardless of the reason, should not be considered for any development. Preparation of the overlay should, ideally, include contact with the HN government. The HN can help to determine if there are any concerns about environmental resources or political, archeological, cultural, historic, or religious considerations, and uncover any aspects of the base camp location or surrounding region that may affect the HN's ability to develop and manage the land in the future. An example of an environmental overlay is provided in Appendix E, Figure E-5 (page E-8).

f. Conduct a functional analysis. This step in the land use planning process relies on the mission and force structure documents, the land area requirements estimate, and the principles and practices discussed in this section. The analysis is an iterative process and will involve several attempts before an acceptable solution is reached.

(1) Different planning organizations have different lists and names for land use categories. In other words, there is no single standard set of categories and titles for land use categories. They can range from just a few categories to hundreds.

(2) In the interest of simplifying the BCDP process, the land use categorizations presented in this first method are reduced to just a few that are functional in nature, have a common purpose, and denote major and significant land uses. The categories listed below are broad in function and used for land use planning. Refinements to primary uses will be made in a later step. These categories include—

- Airfield.
- Operational.
- Maintenance.
- Industrial.
- Supply/storage.
- Administration.
- Community facilities.
- Training areas, facilities, and ranges.
- Ammunition/explosives storage.

- Housing (unaccompanied/other).
- Recreation (indoor/outdoor).
- Medical.
- Open space (safety and AT/FP buffers).

(3) Having acquired an understanding of land use categorization, it is possible to make the functional analysis. The following two techniques demonstrate reliable methods that can be used to verify the affinity relationships and to determine the most efficient flow of functions between and among the major functional land use categories.

(a) *The land use matrix method*. This method of analysis is useful when most members of the planning team are not experienced with graphic techniques and have a limited ability to use map overlays, sketches, or other drawings. The matrix method, when simplified to as few land use categories as possible, is useful also for explaining land use affinity to members of the base camp command group and representatives of assigned units. The matrix uses a "crosswalk" methodology in which each use area is duplicated on both axes and clearly shows land use compatibilities and incompatibilities. See an example of a land use matrix in Appendix E, Table E-3 (page E-9).

(b) *The affinity relationships diagram method*. The commonly used term for this method is bubble diagramming. It is most useful when members of the planning team are trained in and oriented to the use of maps, graphics, sketches, and other drawings. To refine their analysis, some planners go a bit further and draw the bubbles in various sizes to indicate the relative amount of land that must be apportioned for each use. See an example of an affinity relationships diagram in Appendix E, Figure E-6 (page E-10).

g. Produce a functional relationship overlay. Preparing a functional relationship map overlay promotes an understanding of land use dynamics by placing the land area estimate and the functional analysis in the context of the actual base camp location. It consists of a series of alternative trial overlays. The overlay shows the required land use categories by sketching them as “bubbles” over a topographic map of land allocated for the base camp. See Appendix E, Figure E-7 (page E-11), for an example of a functional relationship overlay. Land uses of adjacent areas beyond the camp boundaries are also shown.

(1) This procedure has the following three basic objectives:

- To develop a product that will assist in developing a plan for locating all facilities identified for inclusion by the analysis in a manner that promotes interaction between related, compatible activities while separating incompatible or conflicting ones.
- To preserve and protect significant natural, cultural, and environmental features. Solid land use analysis and site development promotes efficient mission accomplishment, protects and improves living and working

conditions at the base camp and, eventually, contributes to its effective cleanup and closure.

- To ensure that each land use area (and eventually each proposed site within each land use area) has ample space to accommodate both anticipated and unforeseen expansion.

(2) The planning team accomplishes the map analysis as follows:

- Obtain a topographic map or a digital topographic map and refer to the land area requirements estimate. Secure any additional maps and inventories relating to existing buildings, infrastructure, and other real property facilities. Additional supporting materials include a TAB (if applicable and available), an environmental overlay, and the functional analysis bubble diagram or land use matrix. Ideally, topographic maps would show existing facilities. If they do not, these facilities should be sketched onto the map. Label the existing facilities and structures and annotate their status (retain or demolish).
- Analyze and diagram the circulation systems. The ground transportation system is the "spine" of a land use plan. Circulation determines the accessibility and efficiency of flows between one land use and another. Show the major and minor circulation routes and identify potential locations for primary and secondary ECPs for vehicles and pedestrians by relating them to the existing major transportation corridors serving the location. In some instances, heavily used low altitude aircraft corridors should be shown. See Appendix E, Figure E-8 (page E-12), for an example of a circulation systems analysis.
- Analyze the buildable areas. The planning team should consult the location selection record and the environmental overlay and, if necessary, perform additional field reconnaissance of the base camp location. An analysis is made of the land area to verify which land areas will support construction, which are marginal in that respect, and which will not support construction. See Appendix E, Figure E-9 (page E-13), for an example of a buildable areas analysis.
- Identify and analyze major activities and structures. Identify major activities and existing structures, and highlight those facilities that can be used to enhance mission support. For example, there may be a prominent, well-sited building that would serve very well as the base camp’s headquarters. Analyze what activities must take place inside each land use category in order to identify the facilities within them that will have heavy activity flows between them such as the activity flow between a maintenance area and an industrial area, or an activity flow into and out of a community center. This analysis may indicate opportunities for consolidating related, compatible activities that are dependent on each other within a single structure or complex. See Appendix E, Figure E-10 (page E-14), for an example ‘snapshot’ of a major activities and structures analysis.

- Perform additional analyses. Special circumstances may warrant additional map analyses. Examples include analyses of AT/FP and personal/property security, cultural and religious locations, and historical buildings and places.
- Prepare the functional relationship map overlay. After completing a sufficient number of map analyses to rule out any major mistakes and omissions in land use planning, and to unequivocally delineate where development could occur and where it definitely should not occur, the functional relationships map overlay is prepared. If these analyses and the foregoing functional analysis step have been done thoroughly, preparation of the functional relationships overlay will require only a few tries before it presents a reasonably sound planning approach. In essence, this overlay can be thought of as the transfer of the bubble diagram to the analyzed realities of the base camp's land area.

h. Develop alternative land use plans. It is especially important to acquire land and organize and place structures on it, because it directly enhances (or detracts from) mission accomplishment and base camp quality of life. A land use plan is the broad framework within which all subsequent planning will occur. Properly sized land use zones and categories are the compartments within which, and between which development, human habitation, interaction, and expansion will occur.

(1) Land use planning involves questioning, analyzing, and inserting the results of that process into a plan capable of being implemented. In the process of questioning and analyzing, two of the most important questions that planners must keep asking themselves are: "Is there enough area within this land use zone or category to accommodate everything, plus room for development and/or expansion?" And, "Am I cutting off any future options or reducing flexibility by configuring a land use zone or category this way?"

(2) The land use planning physical process is accomplished through the following steps:

(a) The planning team, assisted by representatives of the base camp users if possible, returns to the topographic map discussed earlier and the environmental overlay, and refers to the functional analysis map overlay. If using automated drafting equipment, this would mean referring to the base layer with all topographic and physical features layers, the environmental overlay layer, and a layer containing the functional analysis.

(b) The team begins by sketching or plotting in the boundaries of the various land use zones. If reasonable, the team can be divided into smaller groups and tasked to develop a land use plan. The most effective way to accomplish this is for each group to locate and establish boundaries around the largest and most problematic land use zones or categories first, then work through the smaller and less problematic land use zones and finally, address the land uses, such as buffer zones and nonfiring outdoor training, that are the least dependent on other uses.

(c) Each land use should be individually evaluated for its size adequacy according to the land area requirements estimate. The evaluation should focus on any critical dimensions or clearances (in accordance with the standards and criteria documents) and compatibility with other lands uses (according to the functional analysis).

(d) The groups should reevaluate and adjust their respective copies of the functional analysis map overlay to account for new ideas and insights.

(e) Numerous attempts might be necessary before the groups are satisfied with their land use planning solutions. As each trial land use plan is prepared, the following tests will help evaluate the merits of each proposal. A written record should be kept as each is being tested. The following attributes would be tested:

- Functional relationships among land uses. A relationship exists when the activities that comprise two or more land uses are interdependent. Conversely, some land uses allow greater flexibility in location.
- Dependencies among land uses. Dependencies are evident by the flows of materiel, information, units and people, energy, support services, and administrative services. Expediting flows between two interdependent land uses can best be achieved by locating them next to each other. Flows may be in one or both directions. In a one-directional flow, for example, food from a central rations issue facility moves to DFACs throughout the base camp, implying a one-way dependency in which only one of the functions is the recipient. The best location for the central rations issue facility is influenced by the respective locations of the DFACs it supports. In a two-directional flow, there is a flow in both directions, whereby activities in two different land uses benefit by the flows between them. For example, unaccompanied personnel benefit by living close to retail troop support and MWR facilities because they depend on these facilities. Reciprocally, these facilities are successful because unaccompanied personnel are close by.

(f) Land uses may be linked by organizational relationships and compatibilities of their component activities and equipment. Some examples include—

- A FEST may park and maintain its vehicles in a central motor pool in a nearby location even though the motor pool is operated and controlled by the S-4.
- The organizational vehicle maintenance and parking facilities of the battalions assigned to a BCT can be located near each other and reasonably close to the brigade headquarters and the brigade's subordinate units.
- Units with tracked vehicles operate much differently than wheeled vehicles and have a far greater impact on road surfaces. Separate roads and trails should be provided for them if possible. Tracked-vehicle maintenance and parking areas should be located on the outside edge of built-up areas.

(g) Performance analysis. This test would ensure that each trial land use plan (COA) conforms to the tenets stated in subparagraph 6-3.h. and in the land use planning checklist in Appendix E, Table E-1 (pages E-4 and E-5).

(h) End-state analysis. Each alternative land use plan (COA) must envision the eventual termination of the U.S. mission. The base camp must be effectively cleaned up and closed (see Chapter 10).

(i) Important tenets of land use planning. The land use planning process is defined by various tenets, but planners must keep in mind that there is no "ideal" plan. Each mission, force structure, and available land area is unique. Furthermore, missions, doctrines, needs, and technologies may change with the passage of time. Some common sense rules can be applied in relation to "what belongs next to what." Additionally, most TO facilities designs contain recommended base camp layouts. These recommended layouts can be “site adapted” if there is simply no time to execute the planning process. However, an "ideal land use arrangement" that appears to work well in one place cannot automatically be assumed to work well in another. A few of the more important tenets are discussed in the following paragraphs:

- Adjacent communities. In HNs with functional governmental and civic infrastructure, coordinating with local communities and government activities to shape the land use plan and to resolve differences strengthens the planning process. Toward this objective, a land use plan should, if possible, depict the existing and proposed land uses in areas surrounding the base camp.
- Mixed-use concept. Land use planning is more than just grouping all uses or categories and/or facilities of similar type together in large mass. Each land use area should be a mixture of compatible activities that allow them to function efficiently. For example, housing areas, although shown as a single land use category, usually contain a wide range of troop support facilities and recreational areas, and they may include real property maintenance and repair facilities. Airfields not only contain the operational facilities associated with aircraft; they may also contain housing, dining, and vehicle maintenance facilities for the personnel and units assigned to the airfield. Another way to think of the mixed-use land use planning concept is that the land use structure of a base camp is anchored on a framework of nodes or centers that are concentrations of compatible, interrelated activities (see Figure 6-4) with larger, more predominant and specialized activities, in the largest nodes. The nodes have functional linkages, both within and among nodes. An analogy might be that of a headquarters having subordinate activities in a number of remote locations, all working together to accomplish the mission. The following diagram illustrates the nodes concept as it would apply to Army and Air Force Exchange Service (AAFES) retail operations.

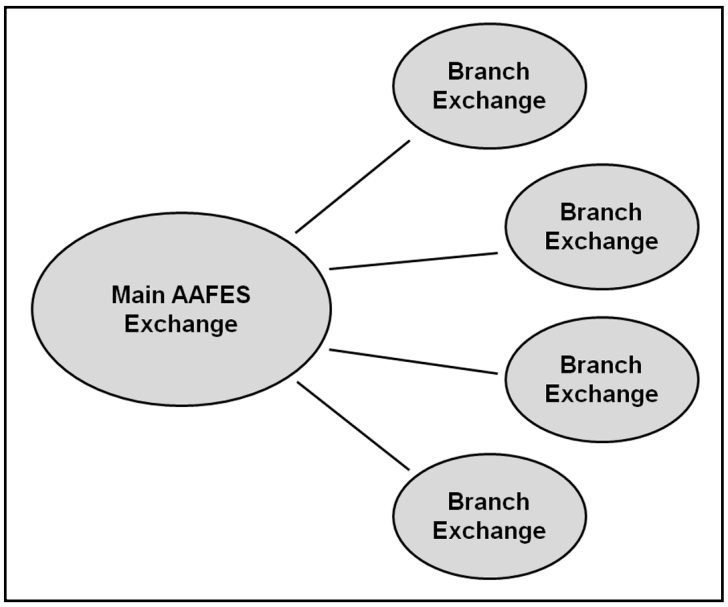

Figure 6-4. Example of main and satellite nodes

- Utilities. The most advantageous general alignment or location of utility system mains, stations, and plants should also be shown (a detailed layout of utility systems occurs later in the planning process).
- Arrange land uses compactly in a built-up area, if threat conditions do not require dispersal.
- Establish open areas outside the built-up areas for training activities; maneuver; and required AT/FP, safety, noise, and operational clearances. A myriad of regulations, criteria, and rules of thumb govern the dimensions, area requirements, safety, isolation, and clearance distances and boundaries related to the configuration and placement of land uses. Many of them require open space to meet standards. Additionally, if U.S. forces are deployed more than several months and are not engaged in active combat, they must conduct sustainment training. This generates the requirement for an array of training facilities, including firing ranges and maneuver training areas (see Figure 6-5, page 6-14).

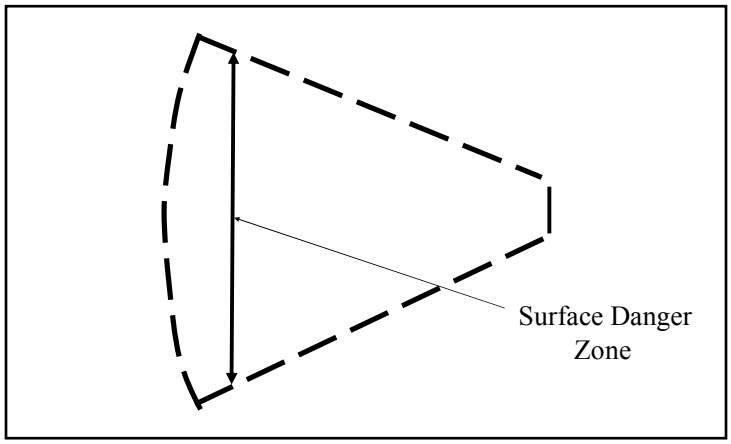

Figure 6-5. Example of safety clearance zone for a firing range

- Designate different land uses for different activity types and intensities. For example, planners would not locate a medical land use adjacent to a busy community center or near a noisy airfield. If using the nodes concept, small clinics and dispensaries might be located in these more active, noisy zones (see Figure 6-6).

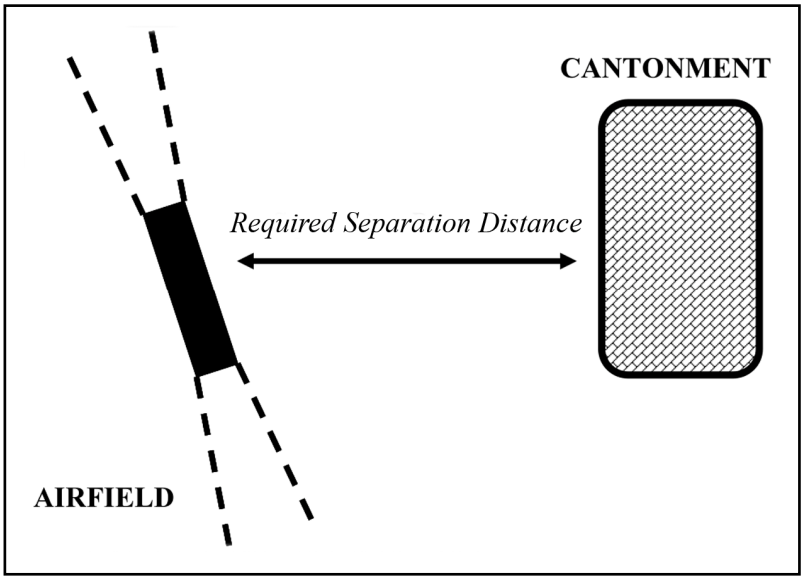

Figure 6-6. Example of required separation distance

- Separate those functions that require special AT/FP, health, safety, or security arrangements. For example, many activities require separation for safety reasons. The quantity safety distance governing the development and operation of ammunition supply points (ASPs), which is shown in Figure 6-7, is a requirement that is widely understood and obeyed. However, one that isn't

very well known is the 0.25-mile (0.4-km) isolation distance and downwind location that is required for sewage and industrial waste treatment facilities.

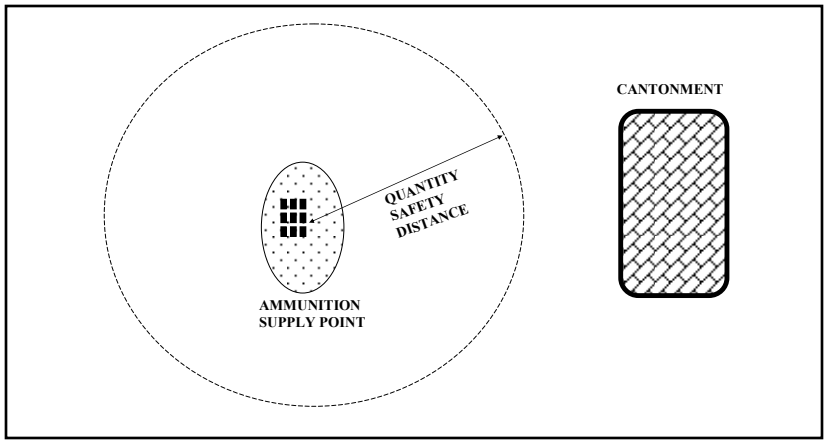

Figure 6-7. Example of quantity safety distance for munitions storage and handling

- Locate land use areas adjacent to each other that have strong functional interrelationships. Troop housing located within convenient walking distance of dining, recreational, or retail facilities is an example of beneficial adjacency (see Figure 6-8).

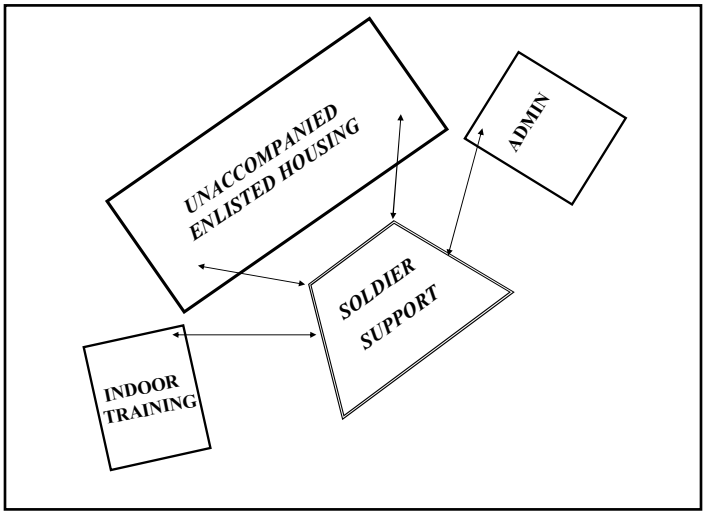

Figure 6-8. Example of convenient walking distance

- Locate mixed, compatible uses within one major area (see Figure 6-9, page 6-16). Group compatible land use functions together in multiple use areas. Surrounding each node, described previously as a part of the mixed-use concept, is a "density" of interaction that declines with increased distance from the center. Distance influences the distribution of activities and the level of activity at any location. A proven rule of thumb that applies to Americans

is that they consider convenient walking distance to be any distance of 0.25 mile (0.4 km) or less.

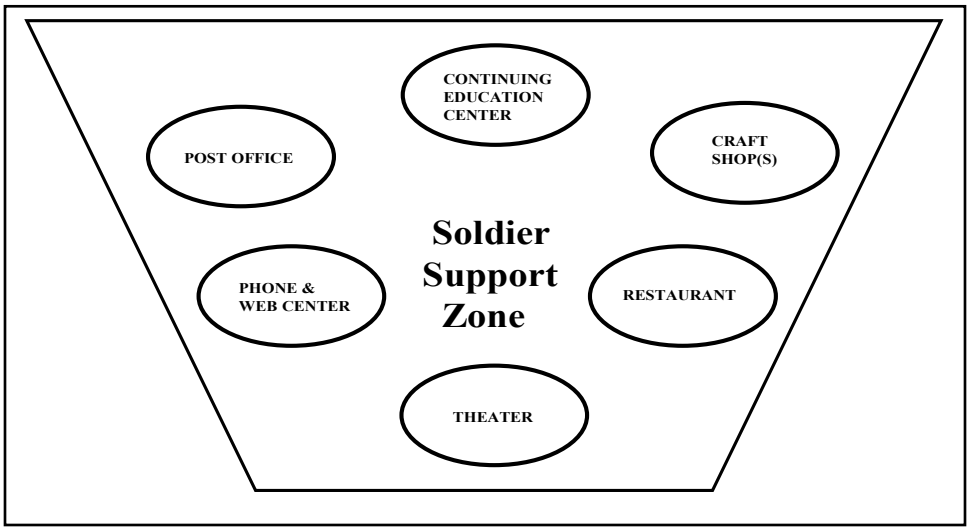

Figure 6-9. Example of mixed and combined uses

- Use the existing traffic circulation and utility systems to serve high activity land use areas. An example might be to locate supply facilities that are subject to heavy truck and rail traffic close to the main traffic artery or rail spurs (see Figure 6-10).

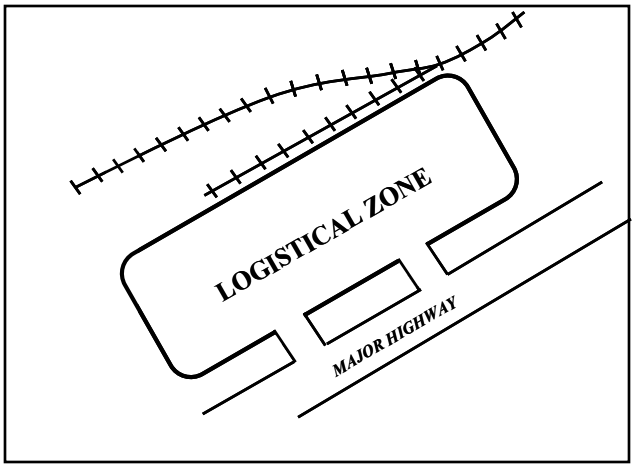

Figure 6-10. Example of high activity area and planned circulation system

- Use natural features and terrain to provide an attractive setting for living areas and other community functions. The use of existing vegetation and terrain features can make a base camp a pleasant place to live and work. For example, recreational facilities located on prominent terrain features can provide

patrons with attractive views of the surrounding countryside, providing a relaxing, calming atmosphere (see Figure 6-11).

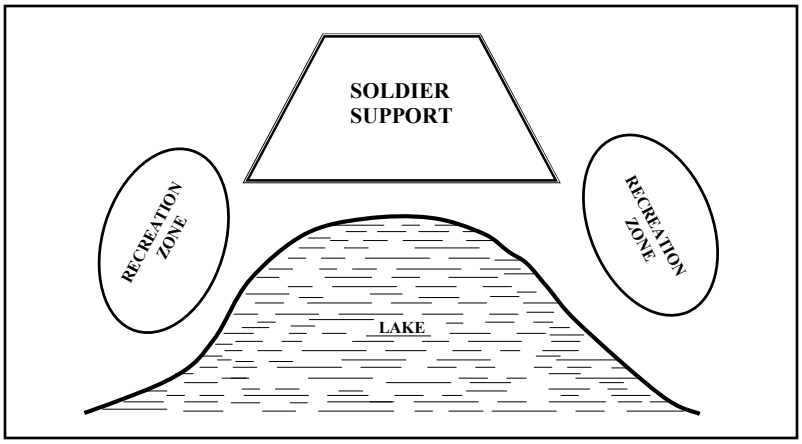

Figure 6-11. Example of using attractive natural features

- Arrange for convenient access to community facilities for the base camp population. On a large base camp, the use of the nodes concept would provide a community center for main troop support facilities as well as satellite retail and recreational facilities within convenient walking distance in the troop housing areas. The distance influence in the nodes concept is shown in Figure 6-12, page 6-18, using an AAFES as an example.

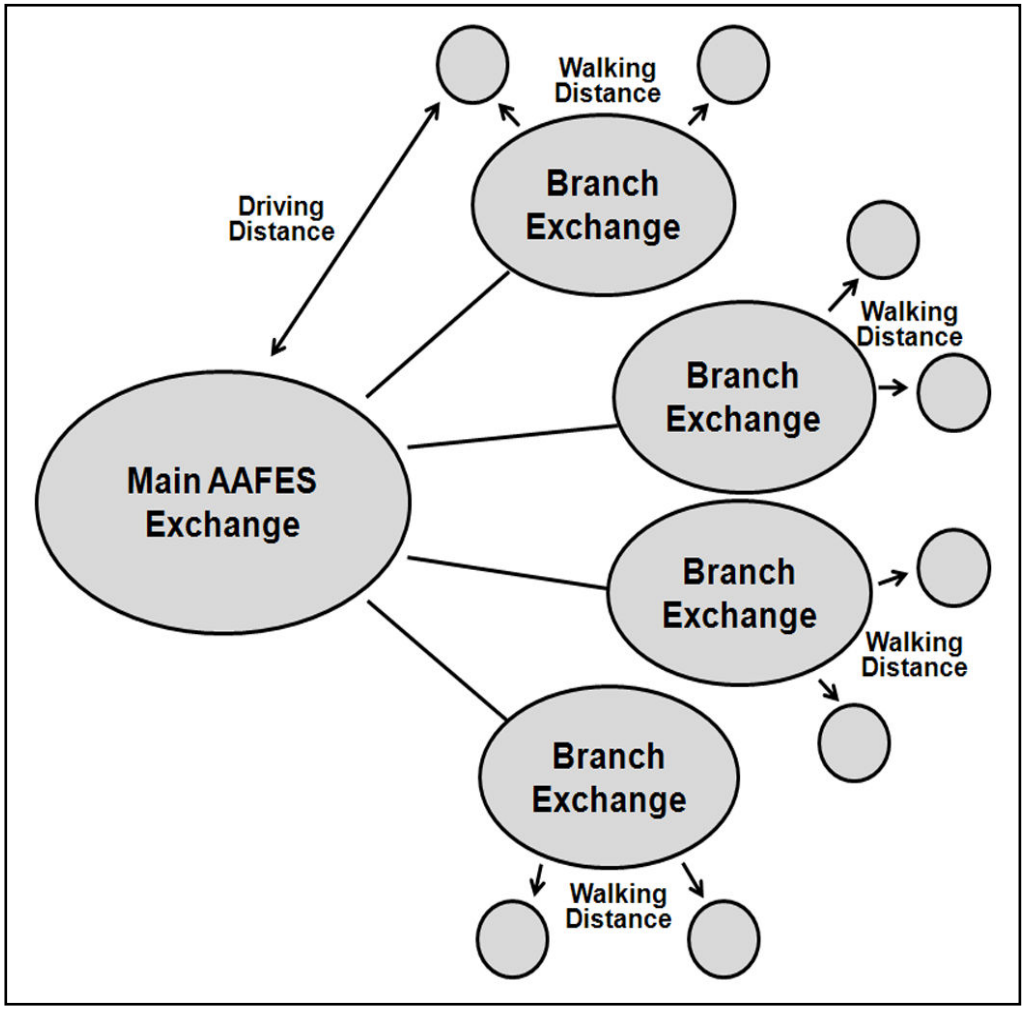

Figure 6-12. Example of the use of nodes to facilitate convenient walking distances

i. Select the best alternative or COA land use plan or take the best from each alternative or COA for a new *best plan*. If the planning team has been separated into groups, each group should have tested its trial plans and arrived at its own best effort. At this point, the entire team comes together and compares each of the planning solutions (see Figure 6-13). Each of the solutions should represent a good, solid alternative or COA land use plan and should be included in the base camp development records. After reviewing all the alternatives, the team has the following two options to select or develop the best alternative or COA:

(1) Choose one of the alternative plans as being superior over the others to recommend to the commander or—

(2) Take the strongest points from each of the alternative plans and arrive at a new "best alternative" land use plan to recommend to the commander.

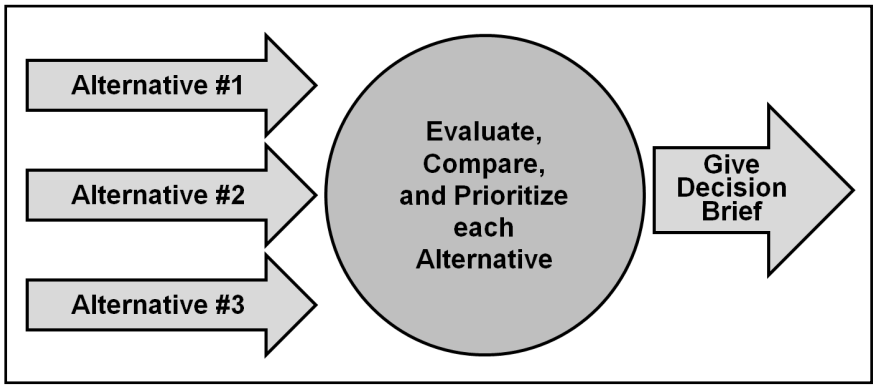

Figure 6-13. The alternatives analysis process

j. Obtain the commander's approval. The planning team carefully consolidates its notes and prepares, schedules, and rehearses a decision briefing to obtain the commander's approval of the recommended land use plan.

(1) It is advantageous to present the functional analysis overlay and the alternative land use plans or COAs during this briefing and discuss the advantages and disadvantages of each. Sometimes it aids comprehension to characterize each of the alternatives with a title, such as "The Disbursed Development," "The Line of Clusters," "The Concentric Rings," and so forth.

(2) A member of the planning team not presenting the briefing should listen carefully and write down the comments and responses of the commander and the staff. The command group will offer valuable guidance and insights that must be incorporated into the finalized land use plan.

(3) In addition to the graphic portion of the land use plan, a set of written companion policies should be discussed and approved. These policies will impact the land use goals and objectives and will be implemented to sustain the land use plan throughout the life of the base camp. The policies would be the rough equivalent of the zoning laws and ordinances that govern the development of most U.S. cities and many counties. They define what can and cannot be constructed, modified, or placed within each land use zone. Without these policies and their enforcement, facility and infrastructure development can become, knowingly or unknowingly, a hodgepodge of incompatible, unsecured, unsafe, unattractive, and inconveniently located facilities. Once the policies are approved and put in place, observance of them becomes a collaborative effort of the base camp command group, the base camp planning board, all units, and the individuals residing on the base camp. Appendix E, Table E-4 (page E-15), shows an example of land use policies. These policies should apply to all levels of subsequent planning.

k. Obtain higher headquarters approval. The review and approval process for the base camp land use plan may vary, based on the uniqueness of each base camp mission.

However, in a typical situation, the review and approval chain likely would proceed from the base camp to the appropriate intermediate headquarters, to the theater command headquarters, and perhaps to HQDA. Special reviews and approvals, such as those required for aviation, munitions, and ranges and training facilities, would likely be obtained, or be underway, before submitting the requirements document through the command approval chain. A typical flow of TO reviews and approval is shown in Figure 5-5, page 5-25.

(1) Once the land use plan is approved by the appropriate command authority, it becomes the centerpiece of the objective land use arrangement. It provides the starting point for all the subsequent steps of the planning, programming, design, and construction processes that result in a complete and useable base camp.

(2) The intervals and requirements for the submittal of formal updates to a base camp's land use plan are established by the theater command. Generally, a major revision of a land use plan represents a very significant planning action. The bulk of the land use planning process may need to be repeated. Examples include—

(a) A base camp that was originally planned as a logistical facility was assigned a new mission to house tactical units, including organic and supporting aviation assets, firing ranges, and maneuver training areas. This would represent a major revision of the land use plan.

(b) A significant reduction of U.S. forces in the theater typically requires that a base camp or portions of the base camp be cleaned up, closed, and returned to the HN. In this case, a small contingent of U.S. personnel would normally remain indefinitely in a much smaller base camp. This would require a significant change to the land use configuration.

(3) In some special cases, it is possible that there would be Executive Office, Cabinet level, or Congressional oversight of a plan to establish a base camp in a foreign country. Therefore, it is conceivable that a planner would be asked to provide information beyond that which is customarily associated with the development of a base camp.

l. Implement and maintain the land use plan. The plan is initially prepared and implemented with the advice and consent of the plan’s affected groups. Planners solicit comments, and coordinate land use approaches with the base camp’s command group, its assigned units, and, in some cases, certain HN representatives, as a routine matter during the development of the land use plan. Once the base camp exists and the base camp planning board is in place, it will assume the responsibility of maintaining the land use plan.

(1) The approved land use plan, along with the record of the land use planning process contained in the base camp development record, is the template within which the base camp will be developed. One way to make the land use plan work is to develop actions and programs that will implement various aspects of the plan. Examples of

actions and programs that are the products of land use policies may include the development of—

- A firing range and maneuver training area complex.
- Unaccompanied personnel housing complexes.
- A service member support and community center area.

(2) Once the base camp becomes operational, there is a need for continuous review, revisions, and submittal of updates for higher headquarters approval. If the land use plan is solid, the objective would be to focus on the details of the plan and not on overhauling its framework. The process depends on keeping users involved and making major or minor revisions based on situations such as changes to the mission, population, user requirements, technology, equipment, weapons systems, HN concerns, and environmental concerns.

(3) The process of implementing a land use plan must be accompanied by an effort to keep it relevant. Regular review by the base camp planning board and the appropriate higher command, at times using USACE, NAVFAC, or AFCESA expertise, is an excellent way to maintain relevance.

(4) The planning process must include a feedback mechanism so that new information can be incorporated into future planning. For example, the acquisition of new data can require an adjustment to the original land use goals and objectives. The best feedback mechanism consists of presenting the land use plan to assigned units and other users, soliciting comments and guidance from the appropriate higher command and, if security conditions permit, providing copies of the land use plan to HN governmental agencies. Appropriate distribution of the land use plan, an open door policy regarding access to the local planning staff, visits by the planners to the units and other users, and frequent base camp planning board meetings collectively represent the most effective means of obtaining timely feedback.

(5) The ultimate test of any plan is the extent to which the base camp's leaders adhere to it. Land use plans that are based upon specific goals and objectives provide a framework for prudent decision making and stave off short-term solutions that either create or fail to solve long-term problems. Leaders and planners must understand that there is a difference between amending a land use plan in light of new information or changed circumstances and altering the plan due to capricious preferences. In certain situations, it is very difficult to maintain the plan without compromising its vision and coherence. The higher headquarters review and approval process and the act of maintaining good working relationships with planners at higher headquarters, can serve as a check and balance for capricious, unwise, or dangerous revisions of a land use plan.

CHAPTER 7

Facilities Requirements Determination

7-1. Introduction. Army facility planners must serve as facilitators, translators, and interpreters between the many interests involved in procuring, using, operating, and cleaning up and closing base camp facilities. This is especially true in the case of determining facility requirements (see Figure 7-1). The planning team must translate facility allowance information into terminology that prospective base camp users can understand and relate to their base camp needs. Planners must listen carefully, question thoroughly, and understand completely what the users say regarding any special base camp and operational needs associated with their respective unit. They must do the same regarding HN needs and preferences, if applicable. Finally, planners must translate all of this into the very precise, quantitative language used by those who will execute the base camp development plan—the project programmers (and other engineering budget planners), designers, other engineers, and the constructors. See Appendix F, Table F-1 (page F-1), for an example facilities requirements planning team checklist.

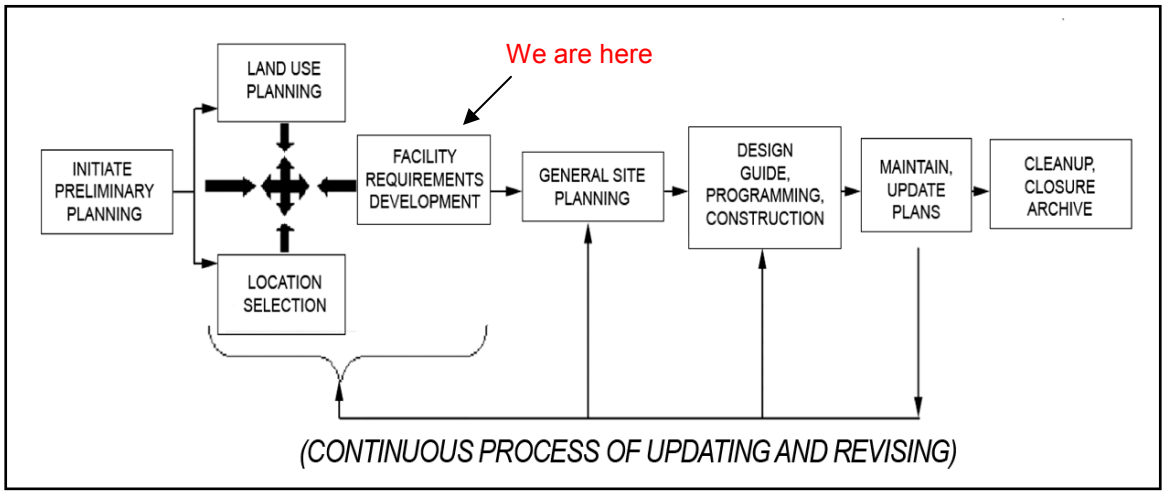

Figure 7-1. The base camp development planning process

a. As discussed in Chapter 4, the planning team has analyzed the mission and the force structure (population and equipment) of the prospective base camp users, made use of the automated TCMS, referred to standards and allowances from recent deployments, and prepared a list of facilities allowances. However, it must be absolutely understood that these allowances are, at best, a preliminary estimate of what might be needed at a base camp; they are not true requirements.

b. Facilities requirements are determined by coordination and dialogue between the planning team, the prospective base camp users and, if the situation allows, HN representatives. Facilities requirements are command-vetted and are an approved list of

existing and proposed facilities and infrastructure that must be present on the base camp to support the mission.

7-2. The Facilities Requirements Development Process. The mechanics of the facilities requirements determination process are shown in Appendix F, Figure F-1 (page F-2). The steps in the process for developing facilities requirements are summarized in the following sections.

a. Inventory existing assets. As an initial and vital step in the requirements development process, an accurate inventory of existing land, facilities, infrastructure, and associated assets should be obtained or conducted. Together with the users and, if possible, the HN representatives, planners inventory and analyze existing facilities and determine which will be used to meet some of the user's facility needs. Plans are made to use these facilities to the maximum extent possible. A thorough inventory is facilitated by obtaining or preparing accurate maps of the base camp area, to include the entire land area, its boundaries and adjacent areas, and the location and configuration of existing facilities. The inventory must be on a building-by-building, system-by-system, and land parcel-by-land parcel level of detail. Automation systems should be used to record the data and to keep it updated. Example lists of the types and measures of data that should be portrayed by a real property inventory are contained in Appendix F, Table F-2 (page F-3).

b. Analyze the mission. Before starting the process, the facilities allowances that were identified during the preliminary planning step are used as the starting point for a dialogue between the planning team, the prospective base camp users and, if possible, the HN's representative(s). In addition to the mission and population data derived from available OPORDs, MTOEs, TDAs, and standard databases, representatives from the units being assigned to the proposed base camp can provide and/or confirm critical unit strength and special support requirements data. Factors such as the mission, the population, the number and type of vehicles and equipment, the terrain, the climate, the EBS, and the planned life span of the base camp, will have a considerable impact on the base camp's facilities requirements. Communication between the planning team and the units they support during mission analysis will likely reveal some of the following, often overlooked allowance-adjusting factors:

(1) Full-time occupants of a base camp create different demands for facilities than part-time occupants, thus it is necessary to determine what percentage of these units' population will actually be full-time occupants. If there will be part-time occupants, knowing what type units will occupy the base camp and how often and for how long they will occupy it is extremely important as it could impact the planning of various utility systems. Commanders' preferences often determine if, and by how much, the requirements for housing and troop support facilities might be reduced to account for part-time residents. Some commanders want bed space for every service member, whether they are present at the base camp or out on operations. Other commanders might decide that permanent residents would be provided housing space and that sufficient

rotational housing space would be provided to accommodate those units that are part-time occupants.

(2) A unit may be allowed facilities that it does not want or need. For example, a particular location may not have enough people to justify those facilities or there may be a lack of funds or personnel to build, operate, and maintain them. This is often experienced in the MWR facilities allowances.

(3) A unit may have special requirements not immediately apparent from reviewing the MTOE or OPORDs. Some examples include specialized firing ranges or maneuver training areas, security facilities, additional entrances or exits, or highly technical equipment requiring exacting standards. Often these and similar unique requirements are not addressed by standard facility allowance criteria, thus the planning team must listen very closely and, at times, coax these special needs out of the base camp user.

(4) Many logistical support units and industrial-type functions require facilities that have no published allowances. Their requirements must be calculated individually and accomplished in close coordination with the headquarters designated to perform the tasks and operate the facilities.

(5) Commanders typically want an efficiency multiplier known as “unit integrity” in housing and associated facilities. Planners must understand both the positive and negative aspects of this concept during the adjustment of facilities allowances.

(a) Maintaining unit integrity enhances commanders' positive C2 of their troops and equipment. This is accomplished most effectively when a unit’s troops and operations are consolidated in one area of a base camp. In particular, this applies to their administrative, operational, housing, maintenance, supply, dining, and some MWR facilities.

(b) Conversely, Congress, budget managers, DA planning criteria, and facility utilization policies often do not recognize and actively discourage unit integrity because it tends to waste building space.

(c) Maintaining unit integrity can cause a significant increase in housing and service member support facility requirements. For example, if the commander of a 550-person battalion was assigned to a brigade base camp that was built in a series of 150-person barracks blocks, it is obvious the battalion would not fit into an even number of blocks. Depending on the battalion, it would require 3.66 blocks. Insisting on unit integrity, the commander would occupy four blocks in order to maintain command, control and property security throughout the entire unit area. The commander would not permit troops from other units to live in the remaining 50 barracks spaces in that fourth block. The spaces likely would be used for that unit’s nonhousing purposes. Multiply this by several battalions and the wasted barracks space becomes very significant. Planners must work with unit commanders to strike a reasonable balance between the preference for unit integrity and the need for efficient facility use. In the case of barracks, it is obvious

that housing structures with a low individual capacity can do much to offset the waste caused by unit integrity.

c. Determine allowances. Allowances are based on the anticipated life span of the base camp (see JP 3-34) and various theater guidance source documents such as the Red Book and the Sand Book. These sources, coupled with the TCMS, will provide the planner the initial planning guidance necessary to determine authorized facilities and the associated square footage for those facilities. The list of allowances will be adjusted to account for the needs that can be met by existing facilities. It is further adjusted to reflect the user's special requirements, allowed but unneeded facilities, command preferences, and other real-world needs and conditions.

d. Coordinate with the customer. While identified as step 4 of the facilities development requirements process, the planner should strive to meet with the user earlier in the process to assist in confirming assumptions and gain a clear understanding of user needs and preferences. Simply stated, coordination with the customer throughout the process is critical to a successful plan and subsequent base camp that fully supports user needs.

e. Determine requirements. Military units that deploy to base camps are often uniquely and specially tailored. Therefore, a unit may not need the "same" facilities identified in allowance criteria and, in fact, may need substantially different or additional ones. Planners must continue to revisit the mission analysis, coordinate, confirm, and negotiate with the using units and, at times, obtain theater command guidance and adjudication regarding the types and sizes of needed facilities. Appendix F, Figure F-2 (page F-4), provides a graphic of the requirements determination process. Tradeoffs among ideal arrangements in a base camp may be made after facility criteria are compared to a unit's real functional requirements. The realities of a base camp development budget almost always mean that a base camp's facility requirements must be rank ordered, based on the importance of each requirement to the base camp's mission. Also, special facilities have unique planning, programming, design, construction, and acquisition standards. These facilities include airfields and aviation support, fuel and munitions storage and handling, standard ranges and training facilities, medical and dental facilities, chapels, commissaries, PXs, working dog kennels, detainee facilities, some types of MWR facilities, special maintenance facilities, AT/FP features, and utility systems. Any adjustments must be reviewed and approved by the respective facility proponents for these types of facilities. Appendix F, Table F-3 (pages F-4 through F-6), provides an example of operational requirements that produce functional requirements.

f. Document existing and required facilities. Facilities requirements are recorded in a TAB. The TAB must have sufficient detail to mesh with the exacting processes of construction project programming (if required), design, and construction. Paragraph 7-3 of this chapter describes the details of developing the TAB.

g. Analyze shortfalls and excesses. The planning team, in coordination with the base camp users and the HN representatives, if applicable, and with solid command support, must analyze the inventory to identify shortfalls and excesses. A fundamental principle for conducting this analysis is to reduce the need for construction by making innovative use of as many existing facilities as possible.

(1) The analysis should include the following tasks:

- Evaluate the condition and adequacy of the existing facilities and eliminate from the inventory those facilities that do not meet health, structural, and safety standards, are not economically repairable, or cannot be renovated or modified to meet user needs. This analysis should include both horizontal (roads and utilities) and vertical construction. In a HN, this typically means negotiating to either demolish the facilities or to mothball them until the base camp area is returned to the HN.
- Encourage commanders to maximize facility use, taking full advantage of those facilities determined to be adequate and able to support the mission. Once use is approved by the commander, ensure that the facilities are completely safe and floor space usage is optimized.
- If the situation warrants, recommend unit and personnel reassignments to improve facility use. In cases where U.S. forces occupy a series of existing base camps, commanders and staffs can work to maximize the use of facilities across more than one base camp, potentially reducing or eliminating theater construction requirements. This practice, called “cross-leveling,” can achieve a better fit between facility assets and unit requirements.
- Identify facility repair and renovation requirements. Repairs or renovations may be required on some existing facilities to bring them to an acceptable standard for their intended use. Such requirements should be noted and identified in the TAB.
- Recommend conversion or diversion of current facilities to meet new requirements. As a base camp’s mission matures and changes over time, a way to solve the problem of providing new or different facilities is to convert and divert existing facilities to meet the new requirements whenever possible. A *conversion* involves a physical alteration of a current facility so that it can serve a different purpose. An example of a conversion is changing a DFAC into transient quarters by adding partitions, doors, hallways, a recreation room, and latrines. A *diversion* involves using a facility for a purpose other than its intended purpose without having to make any physical changes to the building. An example of a diversion is using a former school as administrative space for a personnel services detachment.
- Consider using one facility for more than one purpose as a way of meeting some temporary base camp requirements. For example, the dining area of a DFAC could be used as administrative, conference, or recreational space when it is not being used for its primary purpose.

- Identify additional HN facilities that could be leased or otherwise obtained if needed. Careful analysis of these potential assets, with special consideration of AT/FP, health, and safety adequacy, could reduce or eliminate the need for new construction.

(2) The planning team, in coordination with base camp users, should consider using the following steps to accomplish an analysis of each facility type for which a requirement has been identified:

(a) Determine if a shortfall is a temporary one. For example, there could be a situation where some of the assigned units of a BCT would not be scheduled to join the unit in the base camp. This would eliminate a facility requirement, or another facility action would result in the shortfall being met, where the overall result is that a particular set of required facilities would not have to be constructed.

(b) Except for the above, all other shortages would be considered longer term, and because they represent raw requirements, they should be further refined to account for the realities of each particular situation. Some examples are—

- As discussed earlier, those portions of a base camp's population that operate in the field or have some of its members assigned to other locations would represent a fractional, or reduced, requirement in terms of utilities demand. The same would apply to day workers and transient personnel. If the base camp commander agrees that housing facilities would be provided for the base camp's permanent residents and rotational housing for just one unit that would be standing down from field operations, then a considerable downward adjustment could be made in the housing construction requirement. Still other service members might be required to live in combat vehicles or occupy guard posts and fighting positions for operational security reasons. This might reduce the housing requirement even further.
- Existing surplus building space could be either diverted or modified (converted) to meet new space requirements. Generally, this approach is more cost-effective and time saving than new construction.
- HN assets could meet part of a facility requirement. Leasing space from the HN or negotiating other use agreements with the HN could be a sound way of satisfying some space requirements. Utility support might also be provided by the HN.
- The alternative of new construction or land acquisition actions would be initiated only after all other workable alternatives were examined and discounted.

(c) As shortfalls and excesses are identified and analyzed, they should be incorporated into a series of alternatives or COAs. In the initial stages of any shortfall and excesses analysis effort, it is conceivable that a large number of COAs would be considered for a particular component of a plan, such as a utility system or a traffic

circulation system. As the COAs are further analyzed, planners should conceptualize two or three COAs for each facility type in which a deficit is identified. Each COA should be a logical and workable approach to satisfying a facility requirement. While it is typically enough to consider only three COA schemes for each requirement, the uniqueness of a particular mission may require that more than three COAs be considered.

(d) The COA selection process should begin with an analysis of the COA that has the simplest solution to the facilities requirement. The analysis process should continue by considering the remaining COAs in order of increased complexity and cost. The goal of COA analysis should be to find the best combination of practicality and cost-effectiveness while still meeting the facilities requirement. The realities of such factors as AT/FP, safety, service member quality of life, constructability, budget, materials, labor, and HN limitations and preferences should guide the review, and a dialogue should continue until the most advantageous COA is determined. In close coordination with the prospective user and, if possible, HN representatives, the planner should—

- Determine possible ways and means to meet temporary requirements.
- Identify the refinement calculations that would be used to account for interim, special users.
- Determine the best ways to meet facility requirements using existing assets acquired from the HN or the allies, or as a result of reassigning space.
- Identify those COAs that best meet the land and facilities requirements and that require land acquisition or new construction. Together, they constitute the recommended COA.

h. Recommend the best alternative (course of action). The results of this COA analysis and review process should be brought before the commander, his staff, and the base camp planning board, if one has been established. The most often used method for obtaining approval of planning proposals is to schedule and present a decision briefing for the appropriate decision maker. As with other decision briefings that may be given during the base camp development process, the format is based on an evaluation of alternatives or COAs, the reasoning as to the preferred COA, and a request for a decision or an approval. After the commander's verbal decision or approval, the selected COA must be documented in a dated memorandum for record or similar document. The written record is usually prepared by a member of the planning team for the signature of the commander, and the signed document is placed in the base development planning record.

7-3. The Tabulation of Existing and Required Facilities. A TAB is a summary of the mission; planned population data; plan-shaping vehicles and equipment; existing assets; facility allowances; and facilities requirements, excesses, and shortfalls. It is the fundamental detailed record of the facilities requirements development process.

a. The purpose of a TAB is to depict, in one cohesive document, a base camp's mission, unit strength, and major equipment so that the planner can present a detailed account of the base camp's existing assets, its facility allowances, and its actual facilities

requirements. The TAB promotes the efficient use of existing assets and serves as a basis for programming (or other funding), designing, and constructing the base camp's required facilities.

b. The building blocks of a TAB, as shown in Figure 7-2, are used to finalize the development and portrayal of facility requirements, using either a manual or automated means. The building blocks of a TAB include the portrayal and analysis of the—

- Mission and population data.
- Major and significant, plan-shaping vehicle and equipment data.
- Consideration of operational, functional, and special requirements.
- Inventory and proposed use/disposition of existing assets.
- Allowed facilities, based on standards, allowances, and criteria.
- Required facilities.

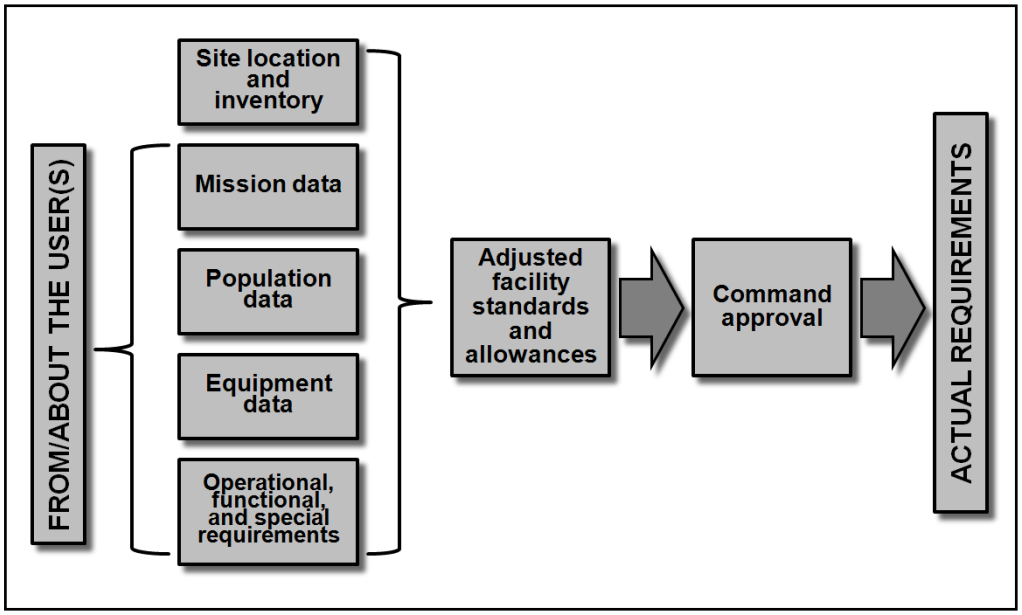

Figure 7-2. The TAB building blocks and process

c. A TAB consists of the following five sections. The first four sections portray the mission, population, organizational, and equipment data initially derived from MTOEs and TDAs (see Chapter 4) and the adjustments that were made to reflect the actual requirements of the prospective base camp users.

- Section I: The Mission Statement.
- Section II: Population Data.
- Section III: Organizational Elements Data.
- Section IV: Plan-Shaping Equipment Data.
- Section V: Facilities Requirements Data. This section is the actual portrayal of existing, allowed, and required facilities. Remarks are added to identify and

explain the requirements, especially the adjustments that significantly deviate from published facility allowances or the rationale for a particular facility requirement.

d. The TAB format will vary depending on the situation. However, it should be prepared making use of commonly available desktop software or TCMS. Whichever technique is used, the user must ensure that it reflects or is modified (in the case of a TCMS TAB) to provide all necessary items such as other units, tenants, contractors, and support requirements. Since the data and other information will change regularly, the user should be very familiar with the selected software. An example of a TAB is presented in Appendix F, Table F-4 (pages F-7 through F-21), and is intended only as one suggested format. The format should be altered by the user to suit the situation.

7-4. Final Review and Approval. The review and approval process for the base camp facilities allowances would most likely consist of a series of information and decision briefings to command groups at appropriate levels. The approval granted would be recognized as being that of a preliminary approval of the facilities that might be required at the proposed base camp. In a typical situation, assuming that a theater command is in place, the review and approval chain likely would proceed from the base camp to the appropriate intermediate headquarters, the theater command headquarters, and perhaps to HQDA. Special reviews and approvals, such as those required for aviation, munitions, ranges, and training facilities, likely would be obtained, or be underway, before submitting the requirements document through the command approval chain. In special cases, there might be Executive Office, Cabinet-level, or Congressional oversight of a plan to establish a base camp in a HN. Therefore, a planner might be asked to provide information beyond that which is customarily associated with the development of the facilities requirements portion of BCDP.

CHAPTER 8

Selected Infrastructure Topics

8-1. Introduction. Base camps often require extensive infrastructure to support operations and ensure an adequate quality of life for base camp residents. The standard to which the infrastructure is developed depends on the base camp's function, size, and life span. Developing and sustaining the camp's infrastructure presents significant challenges, in particular resource and environmental constraints. Added to this challenge is the need to integrate survivability measures throughout the base camp. Areas of particular concern include sanitation, water supply, energy, solid waste, and survivability measures. JP 3-34 establishes a baseline of facility standards and allowances based on the base camp's anticipated life span. These standards are further defined in theater-specific guidance documents (see Appendix C).

8-2. Sanitation. Adequate sanitation is necessary for the quality of life of base camp residents and for environmental protection. Dealing with sanitation issues consumes a considerable portion of the base camp leadership's time. Developing plans early that will support sanitation measures can reduce management issues, improve base camp quality of life, and mitigate environmental concerns.

a. Wastewater. Dealing with wastewater, including gray water and black water, creates significant issues for base camp planners and managers. Common gray water sources include laundries, wash racks, and showers, while black water come from various types of toilet facilities. The measures used to handle these waste streams will vary according to base camp population, base camp standards, contractor services, and base camp location. As a general rule, more austere standards will be associated with base camps that have short life spans, and more primitive means of dealing with wastewater will be used. However, there may be circumstances when the method used will be more typically associated with more robust base camps. Whenever possible, base camp commanders will want to use the best available and efficient system in order to improve quality of life. Location of wastewater disposal must be considered early in the planning phase to minimize odors and prevent contamination of water supplies. A number of methods exist to deal with wastewater issues.

(1) *Burn out latrines*. Burn out latrines are often the first method used for field sanitation. They can be constructed by engineer or other military personnel and use vehicle fuel mixed with the waste in order to burn it. They offer the advantages of being easily constructed with limited skills, tool sets, and materials; they do not take up large amounts of base camp area; they can be located anywhere within the camp consistent with good field sanitation practices; and they minimize the amount of remaining waste that must be disposed of. While effective in many regards, they do present quality of life issues and require separate facilities (generally tubes embedded in the ground in crushed rock) for liquid waste.

(2) *Porta-johns*. Most base camps employ porta-johns at some point in their development. Porta-joins require minimal labor to construct, and they can generally be located anywhere within the base camp. While these facilities are suitable, they generally require contractors for servicing and, unlike burn out latrines, the waste must be moved to a sanitary landfill site.

(3) *Sewerage lagoons*. Sewerage lagoons may be developed in support of base camp operations. They provide a means of treating and disposing both black and gray water, while avoiding the need for contractors to remove waste to landfills (assuming that the overall system integrates flush toilets to dispose of solid wastes). They do, however, require significant land area, proper soil types to reduce the danger of groundwater contamination, and adequate pitch from the facilities to the lagoon to allow for water flow. Odor can be a concern if not properly designed. Lagoons should be located downwind of base camp and a significant distance from water supply. While military engineers may construct simple holding ponds, actual lagoons that provide for proper breakdown of wastes require engineering advice from civil engineers.

(4) *Septic system and leach fields*. A septic system and leach fields allow for both black and gray water treatment and disposal. While an efficient means of disposal, as with lagoons, they require a significant amount of area. In addition to the space requirement, they also need distribution pipes, distribution boxes, septic tanks for solids, crushed rock, and geotextile fabric. These requirements may add to the overall logistics burden. While not completely removing the land area for use, they do limit use of the leach field area to traffic that will not crush the pipe system. Mound systems may be required for high groundwater conditions. For poor percolating soils, alternate secondary treatment such as Multi-Flo aeration units must be designed. Simple constructed wetlands provide final pathogen removal for surface water discharge. Septic system treatment requires civil engineering expertise and site testing to be installed properly.

(5) *Wastewater treatment facilities*. Currently, the military has a limited ability to construct and operate wastewater treatment facilities. Military assets are limited to water purification units which are generally not used to handle black or gray water. Some small, portable or semiportable systems are available from contractors, and the military has engaged USACE reachback assistance or private industry with the requirement to develop portable, scalable systems that will support base camp operations. The use of wastewater treatment systems can greatly reduce logistics requirements by recycling water for use in areas such as toilets, wash racks, and for dust abatement.

b. Dining facilities. Base camps, whether used for military or civilian disaster relief purposes, often have allowances for DFACs. These may be a tent that personnel simply eat in or a structure that resembles a DFAC on an established military installation. Army cooks generally prepare meals using mobile kitchen trailers able to feed up to 350 people or containerized, trailer-mounted systems that can feed up to 600 people. Contractor-operated DFACs, on the other hand, can be quite large and require extensive cooking and food storage facilities (to include refrigeration requirements). Regardless of the size,

DFAC operations require large quantities of water for cooking and cleanup. While units in the field may establish gray water soakage pits for DFAC wastewater, larger base camps will require other options.

c. Personal hygiene. Ensuring personal hygiene is crucial for the health of deployed military personnel. At the most austere end of the standards spectrum, military personnel use field expedient showers to provide a minimal level of hygiene. Military units may also take advantage of laundry and bath units that provide special tents with hot and cold water for showers. Established base camps under more robust standards may use contractor-supplied, prefabricated shower trailers that are often self-contained with water heating and recycling systems. In other cases, military engineers or contractors may construct shower facilities from available materials. As with all wastewater, there is the need to dispose of or recycle it properly.

8-3. Water Supply. Base camps need water for everything from drinking, to sanitation, to vehicle radiators. Since local water systems are often not safe, available, or reliable, other methods of obtaining water must be used. The most common source of drinking water is bottled water. While bottled water is safe and convenient, it does require transportation into the base camp, and the empty bottles represent a significant portion of the base camp's solid waste management. Water purification and well drilling present more sustainable alternatives to the use of bottled water.

a. Water purification. Production of bulk water for all purposes is often accomplished by water purification—generally through the use of ROWPUs. These units are provided by both the military and contractors. Water purification units require adequate space to set up operations, and they must be in close proximity to a surface water source such as streams. In some cases, it may be possible to tap into existing water distribution systems, including fire hydrants. Caution must be exercised to ensure that existing systems meets water quality standards. Also, using existing systems may not be possible if it has a negative impact on the local population.

b. Well drilling. In some cases, well drilling may be an option. Military personnel and civilian contractors both have the capability of drilling water wells. However, before drilling, a study of the hydrogeology and hydrology of the area is required to determine if it is practical. The study should incorporate a test well drilling program. Initial information on hydrogeology is available via USACE reachback. Drilled wells may be integrated into a water distribution system within the base camp, or water may go into storage tanks or bladders for distribution by vehicles. Groundwater normally has a low chemical or biological threat of contamination and does not usually experience a large seasonal variation in quantity. After preventive medicine personnel test approve a groundwater source, treatment is not usually required; however, chlorination is recommended. (See FM 5-484/NAVFAC P-1065/Air Force Manual [AFMAN] 32-1072 for more information.)

8-4. Energy. Base camps require power generation equal to that of a small city. In fact, the inefficiencies inherent in power generation systems and in the design of the facilities typically result in significant power waste. For instance, in hot climates where air conditioning is required, it is not unusual to see air conditioning units capable of cooling a large house being used to cool a small tent. Energy consumption in base camps requires a significant amount of resources. Power generation requires fuel for the generators, materials (such as cables) to establish power distribution, maintenance personnel (often civilian contractors) to maintain and service equipment, and spare parts for the variety of generators that may be in service.

a. Base camp power issues. Most base camps are powered by individual generators that feed power either to a specific facility or piece of equipment, or to a group of structures such as a housing area. While the generators may be attached to a distribution system within the area to which they provide power, they are seldom networked into a comprehensive power grid. Planning for power requirements and integrating the generation and distribution network into the base camp is a significant part of effective base camp planning.

(1) *Generator placement.* Generators must be placed close to the equipment, buildings, or areas that they support in order to minimize the materials needed to establish the distribution system and to avoid voltage drops that can impair equipment function. They must also be located to allow for easy service and maintenance, in particular refueling.

(2) *Generator protection.* Generators should be protected against enemy action and accidents, whenever possible. Protection measures may include overhead roofs, protective walls or berms, and secondary containment measures for fuel spills. In addition to providing protection for generators, the use of protective walls or berms will help to reduce noise pollution.

(3) *Power distribution.* Power cables and distribution boxes feed power from the generator to the various facilities that it supports. In some cases, voltage transformers may also be required to step up or step down voltage as required. Additionally, most U.S. equipment operates at 110 volts, while most foreign countries use 220-volt systems. The cable network itself may be employed above or below ground. In either case, appropriate safety measures must be implemented to prevent damage to cables and to reduce electrocution hazards to personnel.

(4) *Electrical system design*. Most military engineers and engineer units are not trained to establish power distribution networks. While there are some military personnel trained to develop these systems, they are generally few in number. If personnel with the required experience are not available, planners must contact civilian SMEs and will often be required to employ civilian contractors to establish the power grid.

b. Base camp standards related to power generation. Depending on the allowable standard, base camps may be powered by organic military equipment, Army prime power units, or a mix of civilian generators. While the more robust standards may allow for the development of a centralized power system, the more austere standards will rely on de-centralized power generation and distribution (see Appendix C).

(1) *Organic unit equipment.* Military units are generally equipped with a limited number of power generators. Most of these generators range from 3 to 10 kilowatts and are designed to support CP operations and provide a limited amount of power for items such as unit light sets. While other, larger generators (generally ranging from 30 to 100 kilowatts) are available, they are normally dedicated to the operation of specific equipment items and facilities; for example, water purification units, radars, and rock crushers and facilities such as field hospitals. This limited amount of power generation capability should only be depended on for base camps constructed to the organic standards; it should be replaced where possible by more substantial systems as soon as they become available.

(2) *Prime power.* The Army's 249th Engineer Battalion (Prime Power) can provide a limited amount of power generation capability for both military operations and civilian emergencies. Prime power platoons can develop up to 3 megawatts of power, and they have a limited capability to construct and repair overhead power distribution systems. They are also able to provide the expertise needed to conduct power studies and determine power requirements and develop distribution plans. (See FM 3-34.480 for more information.)

(3) *Military base camp sets*. The military employs modular base camp sets, such as Force Provider and Harvest Falcon, to establish base camps on short notice. These preconfigured sets include generation capability sufficient to support the anticipated base camp size.

(4) *Commercial generators*. Once a base camp is established, commercial generators are the most common means of providing power. These generators, whether purchased directly by military units or provided by contractors, produce power to support all aspects of base camp life, thereby freeing up military generators to focus on specific unit requirements. Commercial generators employed in base camps are usually arranged with a generator supporting a specific facility (such as a DFAC) or a group of facilities (such as a block of housing units). In some circumstances, a large generator may provide power to an entire base camp via an electrical distribution system.

c. Other considerations for power generation may include the use of the existing civilian power grid, energy conservation measures, and developing technology.

(1) *Existing civilian power grids*. In well-developed countries with adequate electrical distribution systems, it may be possible to use the existing power network. This may prove to be more efficient and reliable than generator systems; however, certain

restriction will apply. If the network will not support the additional load, the public perceives that U.S. forces are using resources they need. If the threat level is high, using the existing network will not be a viable option.

(2) *Energy conservation measures.* In some cases it may be efficient to introduce energy conservation into the power management program. Measures such as enforcing temperature settings, limiting use of certain items, and designing structures for energy efficiency may reduce the overall electrical load required. While most of these measures would be adopted for base camps at the higher end of the standards scale, some measures, such as providing insulation for tents and limiting power use to certain items, can be implemented at all standard levels.

(3) *Developing technology*. Various initiatives are underway to develop improved electrical generation and distribution systems. Some of these include the use of fuel cells, generators that operate from hydrogen generation, and microgrid systems that control the distribution and generation of electrical power. These systems, when fully matured, may make it possible to reduce the sustainment requirements associated with providing electrical support to base camps.

8-5. Solid Waste. Base camps generate solid waste typical of a small town. This waste includes all types of paper, glass, wood, plastics of all types, metals, and DFAC wastes as well as specific items ranging from broken auto parts to televisions and freezers. Disposing of this waste has become a significant issue for base camp managers. (See TM 5-634/NAVFAC MO-213/Air Force Regulation [AFR] 91-8 for more information.)

a. Landfills. A common method of disposing of solid waste is the use of landfills (see Unified Facilities Criteria [UFC] 2-240-10A for more information). These areas may be used to dispose of most nonhazardous materials. They must be designed to accommodate the population over the anticipated base camp life span. Often, multiple landfill sites will be required, which must be approved by the CCDR responsible for the area of landfill location. Depending on the circumstances, substantial coordination with the HN may be required to obtain the necessary land and possibly environmental permits and studies. Planning considerations when establishing landfills include—

- Locate the landfill downwind from the base camp (or at least downwind from housing, medical, and dining facilities).
- Locate the landfill in a controlled area where personnel using the site are not subject to enemy attack and local civilians will not have access.
- Locate the landfill away from runways (bird hazard), floodplains, wetlands, aquifers, seismic zones, and unstable areas.
- If HN contractors are dumping at the site, coordinate with the supported unit for security considerations.
- Provide recommendations to the base camp residents on items to avoid placing in the landfill, including liquid or hazardous waste.

- Plan for daily and final landfill soil cover materials with proper compaction for control of vectors, water infiltration, gas migration, and erosion, as well as support for vegetation, vehicular traffic, and fire resistance.
- If necessary (due to the depth of the groundwater level and the slope of the land), plan for a liner and a leachate collection system and monitoring (during the life of the landfill and during post-closure) of the landfill for contamination that may migrate off-site.
- Provide proper drainage control around the landfill.
- Address additional environmental requirements (for example, explosive gas control).
- Develop record keeping requirements for the closure plan.
- If off-site landfills are used, temporary holding facilities at the base camp will be required.

b. Burn pits. Burn pits are used to dispose of paper, some plastics, and other combustible items. While burn pits reduce the overall waste volume and may be the preferred means of disposing of certain waste streams, they present some health and quality-of-life issues. As with landfills, burn pits should be located downwind of housing, medical, and dining facilities, whenever possible, and the content entering the burn pit should be monitored to prevent the disposal of HM/HW. Burn pits are a possible solution for smaller camps that do not have contractor support. Mobile incinerators and mobile waste-to-energy systems would be much better than burn pits as long as they are modular, mobile, and simple enough for service members to use and maintain. Live ammunition and batteries must be kept out of burn pits, incinerators, and landfills.

c. Recycling. Recycling offers an opportunity to reduce solid waste requirements and the overall logistics burden. While smaller base camps or those with shorter life spans will often not have provisions for recycling, it can be an advantage on larger camps. Presently, recycling on military base camps is limited to certain items. While items such as plastic, glass, and metal cans are not generally recycled, other items of military use may be. These items include storage containers, wood that may be reused for construction, vehicle parts from damaged or destroyed vehicles, and items that service members may procure such as tables, chairs, and televisions. Provision for a recycling center for items such as these can reduce the overall solid waste burden. In addition, it may be possible to establish sites to store waste POL for future recycling.

d. Commercial contractors. Base camps often use commercial contractors to remove solid waste. In some cases, the waste is disposed of on the base camp; in other cases, it is removed and disposed of in local landfills. When facilities on the base are used, planners should integrate them into the base camp plan. When commercial contractors are used, security and liability concerns may need to be addressed. The supported units may need to develop security measures, such as ECPs, to manage contractors who are removing waste from the base camp.

e. Composting. DFAC waste, wood chips, shredded cardboard, paper, hay, and sewage sludge can be successfully mixed and composted using the AGILE Flex (or similar) composting system. The compost is processed over a six-week period into a usable soil amendment and can serve as a good fill for landfills. Odor can be a major concern if anaerobic conditions occur (due to the lack of adequate turnover). Protective measures for consideration include potable water well and setback distances, vector and dust control measures, surface water runoff requirements, and minimum static water table depths.

f. Incinerators, burn boxes, or air curtain destructors. Medical incinerators should be the standard incinerator used for medical waste because of their optimum design to withstand high temperatures. Commercial incinerators are available that will reduce some components of the solid waste stream to ash (for example, DFAC waste, paper, cardboard, and a wide variety of plastics). Burn boxes or air curtain destructors are least desirable and should be avoided whenever possible because of the air pollutants that result and the high amounts of fuel needed to cause efficient burning (one gallon of fuel per cubic meter of waste). Careful sorting is required to remove ammunition, glass, batteries, metal of all types, and most wood products. Incinerators are also expensive to purchase and operate. Finally, incineration can produce potentially toxic ash. If there are a significant number of batteries in the waste stream, the ash may become contaminated with heavy metals. Composting is typically the preferred method to remove DFAC waste, paper, and cardboard from the solid waste stream. Plastics, POL, and other chemicals are efficiently reduced by incineration. Recycling programs can be used to reduce plastic components more efficiently.

g. Petroleum-contaminated soils (PCS). PCS may be land farmed as they are in the United States. Land farming is an aerobic microbial, ambient temperature process that uses the PCS, a micronutrient source (such as compost), a bulking agent (such as straw or wood chips), and time. The components are mixed and kept somewhat moist so that the microbial community will “eat” the petroleum products within the soil over time. Land farming can be successful on virtually any size plot. PCS from outlying camps or isolated spills can be consolidated and treated at a central location. The bioremediation produces a nutrient-rich soil amendment with greatly reduced petroleum concentrations that can be used for a wide variety of purposes. Disposing of PCS by any other method (for example, putting in containers for third-party disposal) is very expensive and should be avoided in all but extreme circumstances. By using proper base material, such as geotextile liners, clay, or bentonite, groundwater sources can be protected from leachate.

h. Hazardous waste. Management and disposal of HW can be a significant issue. It is important that the waste is carefully managed and disposal options are identified early. HW must be collected in an orderly satellite accumulation point (SAP) as soon as it becomes a hazard. HW is best collected in the original or similar container (55-gallon drum) and must be clearly marked and dated. Ideally it is kept in a covered area, on pallets to be kept off the soil, and have a secondary containment system. A SAP is a temporary storage area, not a permanent solution. If there is a Defense Reutilization and

Marketing Service (DRMS) available, they may accept some HW. Often, however DRMS does not have the necessary agreements in place to transport and dispose of this material. Other means of ultimate disposal include a certified HW incinerator or contract disposal. Finally, HM can be cross-leveled across organizations with the establishment of a hazardous materials mart (HAZ MART) operation. A HAZ MART diverts HM from becoming HW via a central collection point for unused or partially used HM that units turn in and can be reissued to other units. It is not a HW collection point.

i. Integrated waste management. The best approach to handling solid waste is an integrated program that incorporates the best methodologies for the given location to reduce the number of solid waste components that must be destroyed. An integrated approach can conserve resources through a recycling plan and reduce landfill and contractor requirements for removing certain components of the waste system. For smaller base camps, this approach is not economical or practical. Since most of these camps are run by service members with little contractor support, the process must be simple. Whatever the size of the base camp, there must be a plan. However, the plan often depends on the population and the contractor support available. An example of integrated waste management includes—

- Waste segregation at the source into recyclables (plastics, wood, cardboard, and metal).
- Compostable material (DFAC wastes, paper, wood chips, other organics).
- HW.
- Medical waste.
- DRMS-acceptable materials (demilitarized equipment, furniture, computers, hardware, and clothing).
- Burn waste.
- PCS.
- Solid wastes for landfill deposit.

8-6. Protection Considerations. Protection refers to the related tasks and systems that preserve the force so that the commander can apply maximum combat power. Survivability, and in particular survivability construction, refers to measures taken that protect personnel, equipment, and structures from attack and mitigate damage that may result. These measures include those that either conceal potential targets or protect potential targets against damage or destruction. Base camp planners work with the supported units to integrate protection considerations and survivability measures into base camp planning, design, and construction. FM 5-103 and the *Joint Forward Operations Base (JFOB) Force Protection Handbook* provide further guidance on survivability and protection considerations. See FM 3-10 for a broader discussion of protection considerations.

a. Entry control points. Base camps require secure entry and exit locations to control traffic and prevent infiltration by hostile forces. As well as protecting the base camp against infiltration by hostile elements, the ECP must also be able to protect itself

against attack. Common threats against ECPs include attacks by vehicle and suicide bombers as well as direct attacks by small arms and rocket-propelled grenades. ECPs must be designed to allow for the efficient flow of personnel and equipment (and possibly HN labor and supplies) while still providing adequate security against various threats. Multiple ECPs may be necessary for a base camp.

b. Perimeter security. Base camps often employ perimeter security measures in the form of fences, protective walls, or earth berms. These structures enclose the entire base camp area and provide for protection against observation and direct fire. Guard towers, constructed using various methods, are employed to provide additional security. Base camp planners are often called on to support the design of perimeter security features. As with all construction in the TO, the design takes into account available materials and labor skills as well as the supported unit's security requirements.

c. Standoff distances. When planning a base camp, maintaining standoff distances can be an important means of enhancing survivability. Standoff in the larger sense refers to locating the base camp away from populated areas or potential attack locations. This will prevent enemy forces from coming within firing range of the camp without detection. In some cases, this may require removing buildings and clearing the terrain around the camp. For example, trees and rubble piles along the camp perimeter could be removed and flattened to provide clear fields of observation. Maintaining standoff distances also refers to keeping those structures, such as perimeter walls, fencing, and predetonation screens (screens that detonate rocket-propelled grenades or contact-fused munitions before hitting their target), at the required distance from the facilities that they are protecting. Maintaining these standoff distances and employing measures to keep potential enemy forces at a safe distance from potential targets can greatly enhance survivability.

d. Base camp site plan. The base camp site plan integrates efficient overall use and protection requirements. While the base camp location is partially selected based on the tactical situation, planning within the base camp also integrates measures that will increase protection. For example, ammunition holding areas (AHAs) and fuel storage areas will be located away from critical assets and housing areas, and ECPs will be located to minimize civilian vehicle traffic into certain areas of the base camp.

e. Protective construction and facility hardening. Various methods exist for hardening structures against attack. While unit commanders will want to provide the maximum amount of protection possible, certain structures will receive the highest priorities. These include C2 facilities, critical radar units, AHAs, fuel storage areas, and personnel housing. Other common sites include medical facilities, DFACs, and power generation equipment. Survivability measures include measures as simple as placing sand bag walls around tents and as extensive as providing overhead cover for important buildings. Base camp planners integrate facility hardening into the overall plan by ensuring that adequate space is available around structures or groups of structures to

integrate survivability measures. Planners also provide design and construction advice on the development of various survivability measures.

CHAPTER 9

General Site Planning

9-1. Introduction. This chapter describes the general site planning process and how it is accomplished (see Figure 9-1). The goal of this process is to organize requirements and site conditions into a documented plan that supports the base camp's mission. This is accomplished by producing a written record of the general site planning process, a base camp development site plan (BDSP) that portrays the physical layout of the required facilities and infrastructure, and an action plan that establishes the priority and the sequence of base camp development. (See Appendix G, Table G-1 [pages G-1 through G-3], for an example BDSP checklist.) Like all the other components of the BCDP process, general site planning is a process based on an analysis of alternatives or COAs.

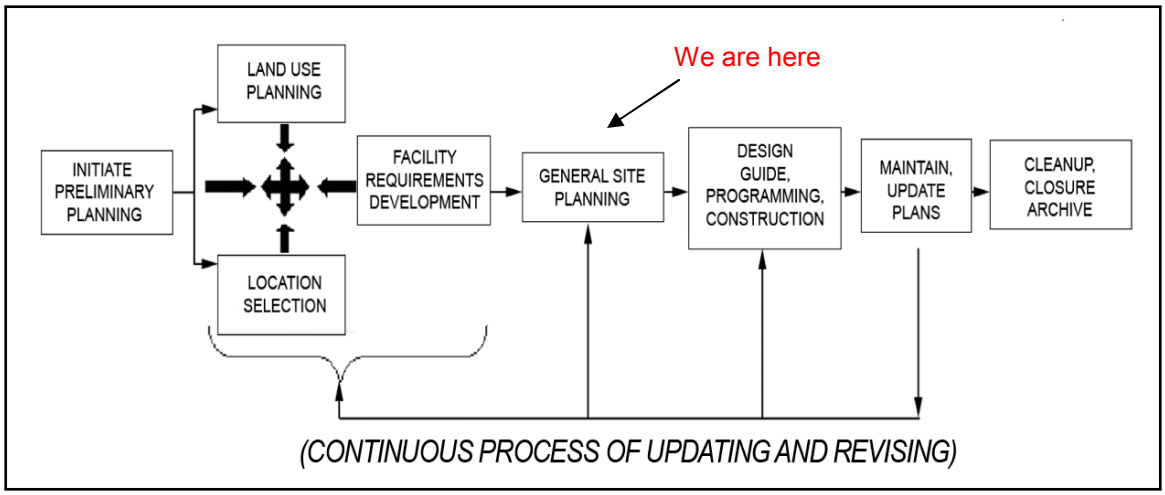

Figure 9-1. The base camp development planning process

a. General site planning, as it applies to base camp development planning, is described as a team effort that includes the selection and layout of site locations for the areas, facilities, and infrastructure required for a specific base camp. It requires multidisciplinary expertise in that it is a process that links together architecture, engineering, military operations planning, AT/FP, the environment, social science, and community planning. Furthermore, throughout the general site planning process, operational, functional, aesthetic, environmental, and health and safety issues are addressed in detail. Finally, the user's interaction with planners and the user's review of the base camp planning effort are indispensable components of a multidisciplinary general site planning process.

b. Oftentimes, planners and engineers define site planning differently. Engineers consider site planning to mean the engineering designs for clearing a single construction site, performing drainage tasks, and stabilizing the surface and subsurface conditions to prepare a worksite for a subsequent project. *General site planning*, the term that is used

in this chapter and in the Army facility planning community, means finding and plotting, to scale, a logical location for every aboveground area, facility, and infrastructure requirement, along with the portrayal of the various, often invisible, major utility corridors, safety clearance zones, and various boundaries that influence and support the plan.

c. The primary "tools" used in general site planning are the land use plan (see Chapter 6), the environmental overlay (see Chapter 6), and the TAB (see Chapter 7).

9-2. The Base Camp Development Site Plan. The BDSP is the overlay of a topographic map or CADD base-plus-features layer that shows the location of future development sites. It contains dimensioned-to-scale, plan-view outlines, called “footprints” of the proposed buildings and site improvements such as roads, hardstands, and parking areas, identified in the TAB. (See Appendix G, Figures G-1 and G-2 [pages G-4 and G-5], for sample footprints.) Once a layout is established and approved by the local commander and, as required, by higher headquarters, the BDSP becomes the basis for the utility system overlays or layers that subsequently become utility system plans and other supplemental plans as required for effective operation of the base camp.

9-3. How to Prepare the Base Camp Development Site Plan. General site planning for a base camp requires a multidisciplinary team approach founded on technical, tactical, and operational considerations. No individual, profession, or discipline has all the knowledge and skills needed to successfully prepare the layout of a base camp. In addition to the many technical experts, it behooves the team to include a base camp user representative.

a. There is no "one right answer.” While there may be dozens of ground rules and “rules of thumb” that increase the chances of preparing a successful BDSP, there is no unanimously ideal BDSP. Each plan will be unique, and each one will be shaped by the mission, the unit(s) it will support; the land upon which it is to be developed; and the respective backgrounds, skills, and contributions of the planning team members.

b. Usually, no more than three or four alternate general site plans are sketched out to depict the proposed development of a base camp. Each alternative approach or COA should support the environmental overlay and the land use plan, and will consist of logical arrangements of the proposed facilities and infrastructure. Each will be derived from the diagramming of ideal affinity relationships, tempered by the reality of existing facility locations and the off-base and on-base environment. Each COA may be based on a theme or point of emphasis to allow comparisons and tradeoffs as the COAs are compared.

c. Base camp development planners have a solid point of reference from which to begin the preparation of the BDSP. The suggested layouts found in the TCMS, site plans from base camps from recent deployments, and plans contained in the various TO facility criteria are examples of quality references. It is important to realize that these layouts are intended only as a starting point, designed to help a planner envision how an array of

facilities might look when arranged on a piece of ground and to see what belongs next to what. Consulting these layouts reduces the chance of major planning mistakes or omissions. Additionally, if there is no opportunity to execute the BCDP process in its entirety, the planning team may be forced to use the criteria-suggested layouts almost exactly as they appear in these sources.

d. There are four essential steps in the preparation of the BDSP. These steps are—

(1) Assemble and review reference documents. When preparing the BDSP, the planning team should assemble and make maximum use of topographic and existing facility maps (or CADD layers) and plans, and any other special studies. Maps that portray existing conditions, especially the environmental overlay and the buildable areas analysis, provide detailed information about the base camp location. This includes information relating to existing buildings and permanent development constraints such as floodplains and cultural features. The land use plan, as discussed in Chapter 6, will serve as the foundation of the BDSP.

(2) Retrieve the requirements from the TAB. The primary source document for building and facility requirements is the TAB. As established in Chapter 7, the TAB identifies the scope of each facility requirement and what portion of the requirement will be met by existing facilities (when there are existing assets).

(3) Obtain or prepare footprints. The next step involves the translation of the various facility requirements displayed in the TAB into typical building footprints to be shown on the BDSP. A footprint is a representation of the proposed facility in plan view (looking straight down from above). The building footprint does not need to be based upon detailed facility planning or design, but should represent the size and shape of a typical facility of the type proposed. For a one-story building, the footprint will reflect the entire square footage of the required facility. For multistory buildings, the area of the footprint will be in proportion to the number of floors, relative to the total square footage of the building. A building footprint can be approximate or exact, depending on the information available. Standard building designs have been identified for certain types of structures and should be used when appropriate. Other facilities shown on the BDSP include new roads, parking lots, storm drainage retention basins, electrical substations, recreational fields, firing ranges, and such. These facilities have typical footprints which are reflective of their function and use.

(4) Place the footprints on the BDSP in the proper land use zones. The location of a facility's footprint within an appropriate land use area is based partly upon the mission and functional requirement for that facility and partly on the siting principles presented later in this chapter. The analysis involved in plotting a site will vary, depending upon the complexity and scope of the facilities being sited. The siting of a single building requires an on-the-ground site inspection and an informal functional analysis, whereas the siting of an entire complex of buildings may require the development and analysis of alternative schemes. An effective technique to develop alternative schemes or COAs is to divide the

team into multidisciplinary subteams of three or four members each and to ask each subteam to put together a buildings and facilities arrangement. A few pointers include—

(a) The largest areas and facilities and those which have the most exacting location requirements should be sited first, followed by the remaining facilities. A metaphor is "to fold the largest pieces of laundry first, then the smaller pieces will shake out more easily." Airfields, helipads, rail yards, firing ranges, POL storage facilities, water and wastewater treatment facilities, and munitions storage and handling facilities are good examples of location- and mission-sensitive facilities.

(b) It is helpful to post a land use "bubble diagram" on a wall along with the land use plan where they can be viewed as a constant reminder of the functional relationships that must be maintained as the facilities are arranged on the base map or base-plus-features CADD layer.

(c) A practical way to go about arranging the facilities is to make to-scale paper cutouts of the various facility footprints (individual facilities as well as complexes) and shift them around on the base map until satisfactory locations and arrangements are found. When using this technique, the planner should refer to AT/FP setback requirements to ensure that proper distances are maintained. Photograph the cutouts on the map and make notes regarding this COA. This becomes the basis for one of several COAs that will lead to selection of the final recommended BDSP. The process should be repeated, using the paper cutouts, to generate additional COAs. This same concept might be applied on a paperless basis with CADD or multilayer/floating object desktop graphics software, making sure to save each alternative layer and make written notes regarding each COA developed.

(d) The selection of a location for facilities should be based on achieving the most desirable functional relationships. As building locations are determined, site access, off-street parking areas, and other site-supporting features should be determined as well.

e. To locate the footprints of proposed buildings and facilities on the BDSP, the team should follow generally accepted site planning principles. Some of these principles include—

(1) The relationships between buildings.

(a) Buildings should be related in groups. Essential considerations include the provision of site access; separation of wheeled-vehicle, tracked-vehicle, pedestrian, and service traffic; the functional and visual arrangement of space between buildings; the establishment of a compatible building scale; architectural character; and provision for future growth and expansion.

(b) Facilities that serve large numbers of people should be sited for maximum visibility and exposure within a building grouping. Facilities with intensive use should be

oriented so that the points of access will be readily identifiable. Visually prominent sites should be considered for buildings of symbolic importance such as the base camp headquarters or the chapel.

(c) The open space network of a building group should be coordinated with the open space system of the entire base camp.

(d) Cluster development patterns which facilitate joint use of common areas should be considered.

(e) Proposed buildings and facilities should be sited to ensure compatibility with adjacent land uses.

(2) Roadways, site access, and parking.

(a) Before determining road networks, planners should consider the location, number, and type of ECPs. The internal road network itself should clearly reflect the service and access requirements of the proposed buildings, facilities, and occupants. Proposed facilities should provide sufficient right-of-way to accommodate possible roadway widening. Major street intersections should be arranged at right angles and with adequate width and site distances. Offset intersections less than 125 feet apart should be avoided. The number of access points to primary roadways should be minimized, and on-street parking should be prohibited on primary and secondary roadways. Access to parking areas should be coordinated so that vehicular pedestrian conflicts are avoided. Internal vehicular circulation should be coordinated to serve a group of buildings. Finally, the relationship of road networks to required standoff distances must also be considered.

(b) Parking areas able to serve several adjacent facilities should be combined when possible. Such areas should be screened and landscaped to reduce visual impact on adjacent areas. Service areas should be located so that they are screened from roadways and adjacent uses. Ideally, circulation should provide at least one way in, a way around or through, and another way out. An experienced infantry sergeant once gave his Soldiers the following tactical guidance, "Never come back in by the same route you followed when you went out." The inverse of this maxim applies equally to the layout and design of circulation systems.

(3) Utilities and drainage. In siting utility and drainage facilities, conflicts with existing major utility lines should be avoided to minimize development cost. All buildings and facilities should be located on well-drained sites and not in major drainage courses.

(4) Energy conservation. Prevailing winds, solar orientation, and microclimatic conditions should be considered in facility siting in order to allow for conservation of energy and user comfort and convenience.

(5) AT/FP, environmental, and safety restrictions. Restrictions such as explosive quantity safety distances, noise contours, airfield and helipad safety zones, historical buildings or places, archeological sites, sensitive natural areas, unsuitable soils, and range surface danger zones should be considered when siting proposed buildings and facilities.

(a) The importance of AT/FP standards cannot be stressed enough. Planners should review applicable AT/FP UFCs such as UFC 4-010-01, UFC 4-010-02, the Joint Forward Operations Base Force Protection Handbook (JFOB), Graphic Training Aid (GTA) 90-01-010, and combatant command standards (Red Book and Sand Book), and consult with AT/FP experts such as those at the USACE Protective Design Center (see Appendix G, Figures G-3 and G-4 [pages G-6 and G-7], for sample standoff distance and building separation diagrams).

(b) When applicable, the boundaries of environmental/safety restrictions will be shown on the BDSP. Even though these restrictions have been considered during development of the land use plan, they should be reviewed again to ensure that all constraints have been considered in siting individual buildings.

9-4. Utility and Other Supplemental Plans. Once the recommended BDSP has been finalized by the planning team with assistance from design engineers (if they are not already team members), the team plans the layout of all primary, secondary, and tertiary utility lines in order to provide the appropriate services to each building and facility. Sites for the proposed water and wastewater treatment plants and solid waste disposal should already be located on the BDSP, but an additional check by the experts is advisable. Communications personnel often will call for site adjustments to meet the operating requirements of their equipment.

a. A key factor in the planning of utility systems layout is providing for maintainability and survivability. For example, a planning team would not locate underground mains along the axis and beneath the pavement of a roadway, but would align it off to the side so that repairs requiring excavation would not interrupt traffic flow. In another example, if high winds or extreme climates are prevalent, buried (instead of overhead) electrical lines should be considered to reduce service interruptions and maintenance requirements.

b. The philosophical approach to the development of utility, information, and communications systems should be one of steady upgrade and improvement within the limits of the particular circumstances found within the theater. For example, the plan should be to replace initial burnout latrines with chemical toilets and then to replace chemical toilets with a robust waterborne sewage collection and treatment system. Generators should give way to commercial, uninterrupted power. Unimproved roadways should be replaced with gravel ones, and wheeled-vehicle roads should be paved with asphalt or concrete. Field communications equipment should be replaced eventually with fixed communications systems, and so forth.

c. Per capita consumption, demand, and production rates for utility systems are established by theater standards criteria and allowances. The guidance documents that supported recent operations are another good source for estimated per capita allowances. Additional criteria are contained in the TCMS. However, it is always best to provide a reasonable amount of additional capacity to meet surge demands and accommodate the possible expansion of the base camp.

d. A utility capacity analysis should be performed wherever existing utilities are available or where they have been partially developed. For example, data is collected about sewer, electrical, and water systems and then compared to the proposed population data to analyze potential utility shortfalls. The philosophy of such an analysis is that "a chain is as strong as its weakest link." The results of one such analysis are shown in Appendix G, Figure G-5 (page G-8).

e. When planning the utility systems, a factor known among military facility planners as planning strength should be taken into account. The planning strength of a base camp is the total number of personnel falling into one of at least three categories.

(1) The number of authorized personnel of the base camp's assigned units. A unit's authorized number of personnel is contained in its MTOE or TDA documents. In a TO situation, the required population and equipment density should be used.

(2) The number of personnel who are not listed on an MTOE or TDA for the units assigned to the base camp. These could include allied or coalition forces assigned to the base camp, nonappropriated fund (NAF) personnel such as community club employees, HN employees, civilian personnel displaced by military operations or emergencies, and contractor personnel.

(3) The number of personnel consisting of portions of any of the two previous categories who would be considered as fractional individuals. Some examples of fractional individuals include—

- HN personnel who work in the base camp only during working hours (about one-third of a 24-hour day).
- Units or portions of units that stage through the base camp on their way to other locations. For example, they might only arrive for an evening meal, an overnight stay, a breakfast meal, refueling and servicing of their vehicles, and then depart.
- Assigned personnel who spend the majority of their time conducting operations away from the base camp. Although many commanders want to provide housing for all of these service members, the fact remains that they place little demand on the utility systems and certain other services while they are not occupying the base camp. Since these personnel are not full-time occupants of a base camp, the contributions of these individuals to the base camp's total planning strength are fractionalized by multiplying the number of

individuals in this category by the fraction of time they would be present at the base camp.

9-5. The Action Plan. Once the BDSP, the utility overlays, and other supplemental plans are completed, the planning team takes the next important step to prepare an action plan. An action plan establishes the priority order for the execution of a base camp's list of development projects, including listing the actions associated with executing these projects. Figure 9-2 shows how the BDSP and the action plan together contribute to the "Where?" and "When?" elements of the BCDP.

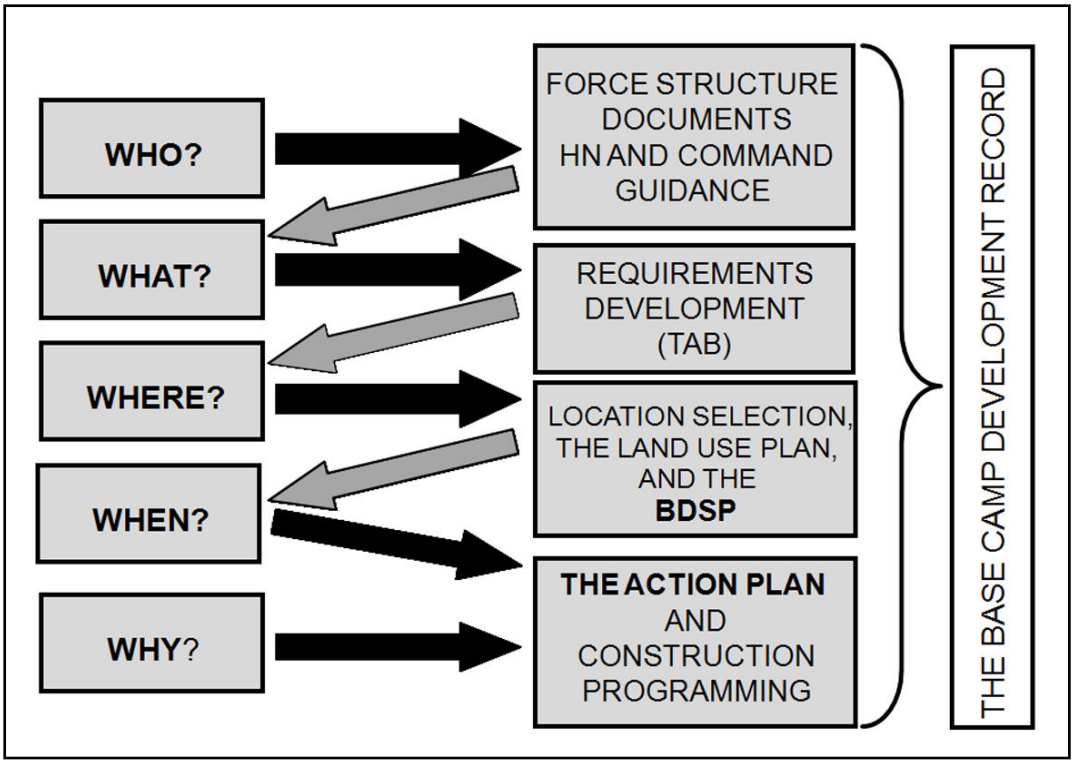

Figure 9-2. Four of the "five Ws" answered by the base camp development plan

9-6. How to Prepare the Base Camp Development Site Plan Action Plan. The implementation of any plan, especially in the case of a BDSP, includes the need to determine what must happen where, in what sequence, when and, often, by whom. The BDSP resolves the "where" issues. But other means are needed to identify what projects and associated actions should be done first, second, third, and so forth. In other words, what has to be known is: "What must happen before other things can happen?" For example, building demolition or explosive ordnance disposal (EOD) may be required even before a new site can be accessed. There may be various nonconstruction actions required, such as moving people out of an area so that development can occur, leasing facilities from the HN so that construction requirements can be reduced, or obtaining funds to pay for a HN labor force.

a. There are several ways to prepare an action plan. The three most common ones are—

(1) A project phasing plan. The first way to prepare an action plan is with a project phasing plan. This project phasing plan becomes a vital part of the BCDP and is prepared and submitted according to the policies of the appropriate higher command. The phasing plan consists of a copy of the BDSP annotated to identify individual project locations, other actions, and the time frames in which the projects will be programmed and executed. It also contains a project phasing map. The basic objective of the project phasing plan is to outline a flexible, short-term program of projects based on the goals, objectives, and site locations proposed by the BDSP. Another important objective of the project phasing plan is to show which improvements have the highest priority for implementation in light of the identified level of allocated funds or other available resources required to implement the plan's recommendations. Also, the document provides a means by which development funding programs can be measured in terms of how well they meet the base camp's requirements.

(a) Project identification. The first step in preparing a phasing plan is to arrange the projects identified by the TAB and/or TCMS into groups. In some cases, the higher headquarters might later combine all of the projects identified into one project and add it to their critical construction list. The groups of projects are as follows:

- New facilities, utilities, and infrastructure that must be constructed.
- Existing facilities and infrastructure that must be improved or repaired to meet functional requirements.
- Existing facilities that must be replaced because they are inadequate.
- Existing utility systems that must be improved or replaced.
- Existing road networks that must be improved or replaced.

(b) Project scope. The scope (size or similar quantitative aspect) of the projects identified in the TAB document represents the basic data for the prioritization of the projects to be included in the project phasing plan and on the project phasing map. Where a project can logically be programmed in two or more stages, project phasing should be considered in order to make the most effective use of available resources. An example of a project phasing map is shown in Appendix G, Figure G-6 (page G-9).

(2) A sequencing chart. A second way to prepare an action plan is to use a sequencing chart. A Gantt chart and a critical path method chart are two examples of a sequencing chart. These charts show a sequence of events that includes not only the construction projects but also the supporting policies, standards, actions, unit relocations, and major maintenance and repair tasks.

(3) Lists of projects and other real property associated actions. A third way to prepare an action plan is to prepare a time-sequenced project list, such as the ones submitted to higher headquarters in support of construction and major maintenance and

repair projects. An example or a portion of a sequencing list is shown in Appendix G, Table G-2 (page G-9).

b. The process for prioritizing construction projects is as follows:

(1) The process should begin with an evaluation of each project on the project list and end with the preparation of a prioritized list of construction projects. To facilitate the prioritization process, the projects should be organized into similar sets of projects that support the specific objectives of the BCDP. The priority of the projects should be based on how each project would—

- Contribute to achieving a specific goal and objective identified in the base camp development record.
- Resolve a current problem or be necessary to carry out other projects.
- Contribute to the completion of facilities or programs already underway.
- Be funded within authorized levels or qualify for funding from other sources.
- Improve the quality of the natural or man-made environment.
- Be incorporated into existing facilities to extend or improve their functional capability.
- Have the capacity to support multiple functions.

(2) The basis for prioritization should be a function of how well each project contributes to accomplishing the goals and objectives of the BCDP. (See Appendix G, Table G-3 [page G-10], for an example of a project priority list with phasing sequence.) One way to prioritize projects is as follows (keep in mind that each priority group could consist of many projects and associated actions):

- Priority Group #1 - Projects that meet an AT/FP, health, safety, or environmental requirement.
- Priority Group #2 - Projects that resolve a critical mission support or functional deficiency.
- Priority Group #3 - Projects that are a necessary precondition for other projects to support base camp development.
- Priority Group #4 - Projects that resolve a current but noncritical functional deficiency.
- Priority Group #5 - Projects that support future expansion capability.
- Priority Group #6 - Other projects.

9-7. The Review and Approval Process. The appropriate combatant or theater commander will designate the level(s) of command that will have site approval authority, with the exception of approvals for special types of projects, as described earlier. A site approval certifies the acceptability and constructability of a proposed facility location. Proper siting denotes that each project identified by the TAB or the TCMS has been located on a proposed site that conforms to the tenets listed on the BCDP checklist.

a. All proposed projects must have site locations portrayed on the BDSP and be approved by the base camp commander and the designated higher command approval authority, regardless of the type of funding or project size. This would apply to all projects that involve—

- Construction or relocation of facilities.
- Additions to existing facilities.
- Replacement of a facility at the same location with a facility of a different use category.
- Facility siting that requires a change to the approved land use plan.

b. In most instances, a project site approval would become invalid when the site location of a project or set of projects changes. The appropriate higher headquarters would determine if a particular shift in location qualifies as a resiting. All site approvals based on safety criteria or a special technical review and approval become invalid when the project scope or location is changed from that which was approved by the command and the agency or office responsible for issuing the initial approval. Requests for revalidating a site approval should be processed as soon as possible after a site relocation or project rescoping requirement becomes known.

c. The combatant or theater commander or the appropriate intermediate commander, if so designated, would determine the BCDP documents to be prepared and those requiring review and approval. Examples of such documents include—

(1) The BDSP as described in this chapter.

(2) Utility overlays to the BDSP showing the existing utilities recommended for retention, modification, abandonment, or replacement; the primary components and alignments of all proposed utilities; and all central utility plants.

(3) The base camp development record with emphasis on the portions that explain the alternatives analysis process that led to the approved BDSP. (See Appendix G, Table G-4 [pages G-11 and G-12], for example formats for the base camp development plan record).

(4) The action plan. This plan would be placed in the base camp development record along with a description of the rationale used in the general site planning process. It might also be submitted as a separate set of documents in support of the construction or land acquisition programming process.

(5) Other possible overlays/layers or variable-scale extracts of the BDSP. These could include—

(a) AT/FP plan. This overlay might portray physical features, measures, zones, and clearances planned to protect the force and to provide for the physical security of property. Typically, this plan is a controlled-access document.

(b) Transportation plan. This plan shows recommendations for the highway and railroad systems that would serve the base camp including proposed layout; type, class, and weight of rail; and width and load capacity of roads, bridges, hardstands, paved parking areas, and tracked-vehicle trails.

(c) Range and training land program development plan. This plan would be prepared in coordination with the USACE Range and Training Land Program (RTLP) Mandatory Center for Expertise (MCX), Huntsville, Alabama. It is normally required for enduring locations where range firing or maneuver training would be conducted on a sustained basis.

(d) Information systems plan. This plan shows existing and proposed major command, control, communication, and information management features.

(e) General drainage plan. This plan shows all existing major storm water drainage facilities recommended for retention, modification, or abandonment and the primary components of all new drainage features and structures.

(f) Airfield plan. At base camps where high-use airfield or heliport facilities are planned, a separate plan would show the airfield facilities only. The scale may vary from the base topographic maps in order to ensure that the layout complies with exacting airfield criteria. Special reviews and approvals are required for this type of plan.

(g) Area development plans. These plans are enlarged portions of the BDSP that show the detailed development of proposed complexes, community centers, utility services, firing ranges, or a single key building and its associated support elements.

(h) Other plans. These plans enhance base camp development and management and are prepared on an optional basis. Some examples are—cultural and natural resources management plans, MWR facilities plans, unit-specific site plan extracts, AAFES facilities plans, facilities utilization plans, facility maintenance and repair plans, parking plans, DFAC support plans, and signage plans.

d. The review and approval process for the recommended base camp requirements COA would vary based on the respective commands and the uniqueness of each base camp mission.

(1) In a typical situation, the review and approval chain likely would proceed from the base camp to the appropriate intermediate headquarters, to the theater and/or combatant command headquarters, and perhaps to HQDA. Special reviews and approvals, such as those required for aviation, munitions, and ranges and training

facilities, should be obtained in advance, or be underway, before submitting the BDSP and action plan through the command approval chain.

(2) In some special cases, there could be Executive Office, Cabinet-level, or Congressional oversight of a plan to establish a base camp. In such cases, a planner might be asked to provide information beyond that which is customarily associated with the development of a base camp.

CHAPTER 10

Base Camp Cleanup and Closure

10-1. Introduction. When the U.S. military presence in a HN is terminated or reduced, the force is reconfigured, or the United States no longer requires a particular location, base camp cleanup and closure actions will likely become necessary (see Figure 10-1). Base camp cleanup and closure, when planned and properly executed, is a complex set of procedures.

a. After prior wars, many U.S. military base camp areas were stripped of valuable property and equipment, fenced off, then left to rust and deteriorate. Munitions, petroleum products, toxic chemicals, combat losses, and solid wastes were improperly buried in unmarked, unmapped locations or simply left where they stood. Not only did this situation occur in overseas areas, the same condition is sometimes found within the United States. This has left a hazardous and dangerous legacy in many locations.

b. A key element of a sound BCDP is that base camp cleanup and closure planning must start when base camp planning first begins. Exit strategy development intensifies as the location selection process and the environmental baseline analysis are executed and land use and general site planning are accomplished. The strategy must go on to plan the cleanup, restoration, and return of the base camp land area to its HN owners.

c. It is vital that an initial EBS and EHSA be performed as soon as possible to accurately document the site condition. This information is crucial not only for the health of service members and civilians, but also to provide a baseline of information about the site to ensure that U.S. forces do not incur additional liability for preexisting environmental conditions.

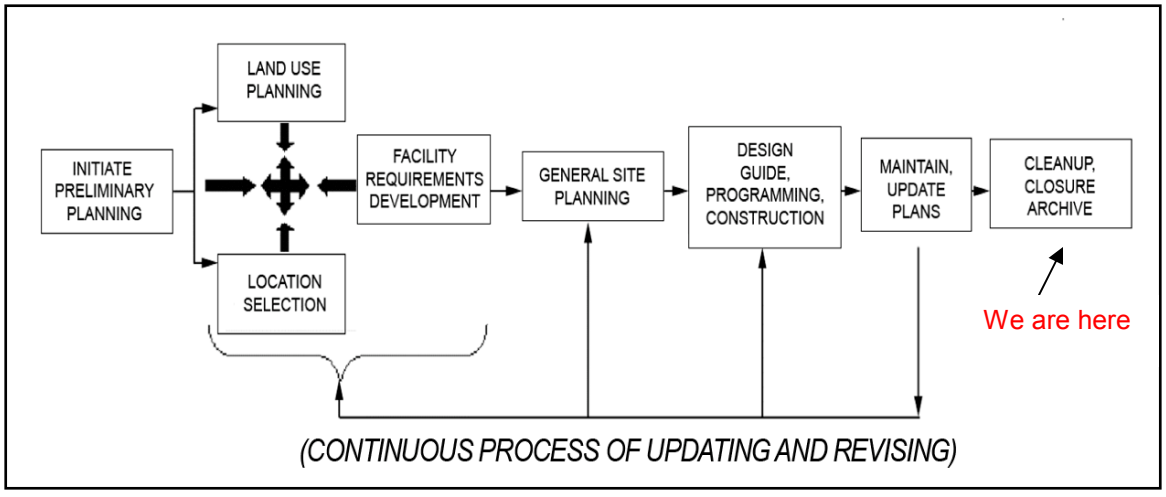

Figure 10-1. The base camp development planning process

10-2. Legal Requirements and Considerations. A wide range of U.S. and HN laws, regulations, policies, and procedures may apply to an operation involving the cleanup and closure of a base camp. In those cases where U.S. policies are more stringent than those of the HN, the U.S. policies will usually govern. Although they do not have the force of law within a TO, the ethical and practical intent, as well as the spirit, of many U.S. laws strongly influence how base camp cleanup and closure operations should be planned and executed. Specifically, there are certain laws and agreements which have direct impact on base camp operations.

a. Land use agreements. The land use agreement for the U.S. occupancy of a base camp is the basis for the facilities-related interaction between the United States and the HN and is the keystone document in fostering the successful execution of a cleanup and closure plan. The land use agreement may be an appendix to a SOFA. The land use agreement would define where the U.S. military presence will be located and what HN facilities it may use. This document would contain information about how a base camp cleanup and closure operation would be coordinated, executed, inspected, and documented.

b. Status of forces agreements. SOFAs are arrangements made between the United States and specific HNs that specify various privileges and responsibilities on the part of both parties. These agreements include a number of areas, from the legal status of U.S. forces and personnel, to particular basing rights at certain locations. These agreements may also include information specific to the HN regarding base camp construction standards, HN contracting, cleanup and closure guidelines, and environmental guidance.

c. Final governing standards (FGS). While SOFAs apply to a variety of considerations, FGS are environmental standards developed in cooperation with a specific HN. While the environmental considerations of base camp closure and cleanup may be specified in the FGS, other aspects of camp closure, such as facility turnover to the HN, may be found in the SOFA. DOD Publication 4715.5-G provides the criteria for developing FGS.

d. Overseas environmental baseline guidance document. If specific SOFAs and/or FGS are not developed, base camps will adhere to provisions in DOD Publication 4715.5-G as applicable. This publication provides a baseline of environmental compliance considerations. Command policy and fragmentary orders should also be reviewed for environmental considerations.

e. Guidance in OPLANs and OPORDs. Annex L to Joint OPORDs and Appendix 2 to Annex F (Engineer) of Army OPORDs provide environmental guidance to units conducting operations. This guidance will provide information on how the commander sees the unit executing its mission with respect to environmental considerations. This information, in particular that found in Annex L to Joint OPORDs, will reflect the guidance received from the theater Joint Environmental Management Board and will integrate the various legal requirements.

f. Basel Convention. The Basel Convention is an international agreement that regulates the movement of HM/HW across international boundaries. This convention may affect base camp operation, cleanup, and closure by impacting how HM/HW is disposed of.

g. Executive Order 11987, Organic Organisms. This executive order prohibits the importation of exotic species, including plants, animals, and fungi, into the U.S. ecosystem. As a result of this order, all U.S. equipment must be washed and inspected before return to the United States. An implied task that results from this order is the need to establish wash rack facilities at base camps, in particular ISBs where equipment is being prepared for movement, in order to clean equipment.

10-3. Operational Considerations Related to Base Camp Cleanup and Closure. Base camp cleanup and closure presents many challenges. In most circumstances, agreements with the HN specify the final end state of camp closure or turnover. Since it is also necessary for forces to continue living on or near that camp, the closure plan must take this and the associated AT/FP measures into account.

a. Base camp closure agreements. If a base camp closure agreement exists with the HN, it will drive the procedures and end state of the camp closure. The overall agreement will specify the status and condition of the camp at turnover or closure. Preferably, the land use agreement will establish the end state of the property before camp closure or turnover. A number of areas may be addressed when dealing with base camp cleanup and closure agreements. These should be integrated into the base camp closure plan.

b. The base camp closure plan. The centerpiece of a superior base camp cleanup and closure plan is the meticulous documentation of every task performed as part of the cleanup and closure operation. The base camp cleanup and closure plan is the mechanism that governs how the cleanup and closure operation, as indicated in the closure agreement, will be performed, managed, and documented. As a minimum, a base camp cleanup and closure plan should document the following tasks:

(1) Condition of the property. The initial EBS should provide a baseline for what the property looked like, especially with regard to environmental considerations, before the camp was established. The closure plan will address issues such as filling in excavations, removing structures, closing landfills, remediating the environment, and restoring pre-existing land uses such as agriculture.

(2) Disposition of facilities. If there were existing structured on the site, or if others were built, the closure plan will have to address if those buildings are be removed or turned over to the HN. If turnover is anticipated, the plan should also include guidance on the facility conditions and specify who is to perform what level of repairs.

(3) Environmental cleanup standards. The closure plan should include which environmental standards, such as the SOFA, FGS, or DOD Publication 4715.5-G, will be used and how those provision will be implemented.

(4) UXO removal. UXO removal is a crucial part of base camp closure, and the plan should address the responsibilities of all parties involved.

(5) Site mapping. This task encompasses land areas, buildings and structures, and infrastructure, and would include a real property inventory (RPI) or building information schedule (BIS). Corresponding maps would be annotated with the locations of various cleanup and closure actions, and may also indicate the phasing of these tasks. The site mapping should show the base camp infrastructure as well as any UXO, fuel and HM/HW spills, and other environmental considerations.

(6) Execution of base camp closure. Creating phasing plans, schedules, and specific task assignments for realistically achieving the desired land and facilities condition is essential to an effective closure plan. The phasing plans and time frames for achieving the objective end state should be sequenced in priorities; for example, which tasks should happen first, second, third, and so forth? Who is assigned to perform these tasks? Which tasks must be accomplished before others? Which tasks can be accomplished simultaneously? Critical path or Gantt charts could be used to portray phasing. Appendix H provides a sample of this portion of a base camp closure plan.

(7) Checklists. Checklists should be developed for inspectors to certify the acceptability or unacceptability of the many cleanup and closure tasks at predetermined phases of execution and to indicate what corrective actions would be required. This is especially important in the case of EOD; nuclear, biological, and chemical (NBC) weapons; certification of firing range cleanup and closure; and hazardous and toxic waste cleanup and disposal (see Appendix H).

(8) Methods of adjudicating claims. In the event that claims for damages do incur, or there are disputes over closure standards, a method of adjudicating these claims should be included in the closure document.

(9) Signatures. Provide a section in the plan for appropriate U.S. and HN signatures to certify that the agreed upon objective end state conditions have been achieved.

(10) Uncompleted actions. Provide a section in the plan (if applicable) to indicate the activities and locations where the objective condition could not be achieved, including the appropriate explanations and justifications.

(11) Base camp records. Maintain accurate records of before, during, and after activities to assist with base camp closure and liability issues (see paragraph 10-5).

c. Specific closure considerations. A number of areas within the base camp closure may require specific considerations. Some of these include facilities, disposition of materials, force protection measures, land, and environmental considerations.

(1) Facilities. Whether existing or new construction was used in the base camp, a plan must be developed to specify the facility turnover to the HN. Considerations for facility turnover include—

- Which buildings will be turned over and which one will be demolished or removed.
- Who is responsible for removal or demolition and what is the disposition plan for waste materials?
- What are the provisions for the joint inspection program between U.S. forces and the HN?
- Should financial arrangements be made for the transfer of funds to implement building repair or demolition?
- What are the provisions for the legal transfer of real property?

(2) Disposition of materials. Base camps include large quantities of a variety of different materials, ranging from concrete barriers for AT/FP to electrical wiring providing power distribution for the base camp. In most cases, these materials will not be removed by U.S. forces, but will be turned over to the HN or disposed of properly. The base camp closure plan should address the disposition of these materials. Options may include disposal, sale to the HN government, sale to HN civilians, or “controlled looting," whereby civilians are allowed to scavenge for materials. Some materials that are often specified for disposition include—

- Construction materials.
- Office furniture.
- Generators and heating and air conditioning units.
- Electrical wiring.
- Plumbing, water, and sewerage materials.
- General supplies.
- Communications wire and equipment.
- Tents.

(3) Protection measures. It will likely be necessary to leave certain AT/FP measures in place during the cleanup and closure process. The base camp closure plan should include considerations related to maintaining AT/FP measures, while ensuring that those not needed are integrated into closure. Many of the materials associated with base camp protection will be disposed of locally or turned over to the HN. Some of the specific areas of concern include—

- Removing or turning over barbed wire and perimeter fencing.
- Filling in fighting positions.

- Removing or turning over concrete barriers and HESCO barriers or sand bags.
- Bulldozing protective berms and filling in antivehicle ditches.
- Removing or turning over additional structures and material such as guard towers and perimeter lighting.

(4) Land. In some cases, it may be necessary to return the land to its original condition. This may include the removal of any additional rock or gravel that was spread on the site, the removal of roads, regrading the area to match its original drainage, and re-establishing agricultural areas.

(5) Environmental considerations. A variety of environmental considerations must be addressed. These are discussed further in paragraph 10-6.

10-4. Executing Base Camp Closure. The base camp closure assessment team (BCCAT) is a high-level planning team that executes the orders to deconstruct base camp assets and enables the redeployment of military units that were stationed there. It works to develop and execute base camp cleanup and closure. Activities lists associated with the BCCAT and base camp closure in general are located in Appendix H.

a. Tactical considerations. The tactical situation at the time that the base camp closure is executed will determine much of how the closure plan is executed. A forced withdrawal from the camp, whether caused by the military, environmental, or political situation, will greatly reduce the amount of closure activities that can be executed. The threat condition may dictate that only essential personnel and supplies are removed in order to speed up the closure process and reduce the number of convoys required. In addition, the tactical situation will dictate the amount and types of AT/FP measures that must remain in place.

b. Approaches to base camp cleanup and closure. The base camp cleanup and closure team develops and identifies at least three solid base camp cleanup and closure alternative plans, selects the best alternative, briefs it to the commander for approval and, once approved, proceeds with cleanup and closure. Although there are many detailed approaches to accomplishing base camp cleanup and closure across the broad range of base camp facilities, several general ones (each of which is suitable for modification or in combination with other alternatives) are discussed as follows:

(1) The regressive approach. A regressive approach means that the base camp cleanup and closure team, along with an assigned military and civilian workforce, would accomplish all cleanup, demolition, and disposal actions for a base camp where living and support facilities gradually consolidate (shrink and decrease) over time.

(a) For example, in the case where utility services have been disconnected, the base camp cleanup and closure team and its assigned workforce would be relying on portable water tanks and power generators.

(b) Another example is the case where all buildings have been dismantled. Cleanup and closure personnel would operate from tents, containers, and their assigned vehicles while completing base camp cleanup and closure operations.

(2) The enclave approach. In this approach, the transition team, its workforce, and the security force, would occupy a secured central enclave of facilities within the base camp area throughout the cleanup and closure process. Beginning at the base camp periphery, all other facilities would be demolished on an incremental basis until the central enclave is reached. Then the team and its personnel would occupy short-term living space, such as containers or tents, until the last enclave would be eliminated.

(3) The off-site approach. In this approach, the team and its assigned workforce and security force would live at a location other than the base camp, such as at another U.S. facility or on the local economy. Security forces would protect the base camp at all times. The cleanup and demolition operation would be carried out across-the-board without the need to retain any facilities and services, because there would be no remaining full-time occupants.

(4) The contractor approach. Under this alternative, the base camp would be vacated by U.S. forces and turned over to a U.S. or multinational contractor for cleanup and closure. The contract would be prepared and awarded by the applicable joint contracting command. The base camp cleanup and closure team would have critical input to this process and may be asked by the joint contracting command to assist in administering the contract. Although this might be the most costly alternative to execute, it would free U.S. military forces for other missions.

(5) The host nation government approach. This approach would turn over the base camp, in whole or in part, to the HN for either closure using HN labor or continued use by the HN. It is important to understand that when government-owned structures and/or equipment are turned over to a HN, coordination through the Office of Defense Cooperation, the U.S. Embassy, and the real estate team which may be augmented or otherwise supported by the USACE Contingency Real Estate Support Teams (CREST) must be accomplished before closure. This requires interagency coordination between the Secretary of Defense (SECDEF), the Joint Chiefs of Staff, and the DOS. The base camp cleanup and closure team would have less control over this alternative as compared to the others. Such an approach requires formal agreements with the HN that release the United States from all liabilities in connection with turnover of the base camp to the HN. Possible conditions of turnover might be—

(a) On an "as-is" basis, although interagency coordination must be accomplished first as described above.

(b) After the United States performs a specified amount of cleanup, demolition, maintenance, and repair.

(c) After the HN performs a specified amount of U.S.-reimbursed cleanup, demolition, maintenance, and repair.

(6) The U.S. intragovernmental agency approach. In this approach, the base camp would be turned over to a specific U.S. government agency, such as the United States Agency for International Development or the Peace Corps, based on an agreement between DOD, through the U.S. DOS, and another U.S. government department. Turnover will be either in an "as-is" condition or after certain maintenance, repair, and cleanup tasks have been performed. A transition period of joint action between the BCCAT and the receiving agency would be required for property transfer, redeployment, or disposal tasks. For example, a joint command turns over a base camp to the U.S. DOS for housing displaced persons.

10-5. The Base Camp Cleanup and Closure Archive. The base camp cleanup and closure archive is a compendium of documents, maps, the complete base camp development plan, audiovisual media, closeout EBS, and other information that records the life span of a base camp through to its cleanup and closure—what has taken place and been done there by whom, where, when, how and, in some cases, why.

a. Reasons for establishing a base camp cleanup and closure archive include—

- Establishing a complete record of what was done, what could not be done, and why.
- Influencing future land use.
- Providing a record to prevent future liability against U.S. forces.
- Providing maps and records to ensure environmental protection and the safety of HN civilians.

b. The U.S. military may not leave a base camp without first preparing a complete record of what was done and what was not done, or not possible to do, to clean it up and close it. A detailed, permanent historical record of the location should be created with the objective of facilitating the future use of the location, while at the same time preventing unknown future actions that could jeopardize health, life, safety, and the environment. Ethically, the United States may not absolve itself of the responsibility for how it used the land it occupied. Once it is assembled, the recommended process for administering the base camp cleanup and closure archive is—

(1) First, the BCCAT would take the archive to the appropriate security office, where it would be reviewed to determine which parts are classified (not releasable to the HN, allies, or the U.S. general public).

(2) Second, the full record copy of the archive would be sent to the office designated as the ‘office of record’ for base camp cleanup and closure archives by the appropriate unified command or theater commander. For example, within the U.S. Army

Europe (USAREUR) the office of record for these archives is USAREUR-Office of the Judge Advocate.

(3) Third, the archive should be provided to the appropriate U.S. DOS representative, because the DOS likely would assume that providing base camp closure information to the HN is their responsibility, subsequent to their representatives signing appropriate statements of closure. A copy of the archive should also be forwarded to the Headquarters, USACE Office of History and USACHPPM.

(4) Finally, the DOS or an office of record designated by the theater commander would certify the archive, then provide an abridged, unclassified version of it to the HN (if applicable), U.S. allies, and the U.S. National Archives for the Public Record.

c. The base camp cleanup and closure archive documents and maintains the following key information:

(1) Information that may be required in the future by individuals conducting approved scientific, medical, environmental, legal, and military research.

(2) General information regarding the agreements between the United States and the HN that form a chronological history of the base camp, including information on its occupants and operations and the facts detailing its cleanup and closure.

(3) Precautionary information relating to health, safety, and environmental matters, especially with respect to the existence of red zones (areas containing UXO, NBC material, and other hazardous and toxic residue).

(4) Technical information and operational records regarding any facilities and equipment that existed in a base camp when the United States relinquished control of it to the HN, where applicable.

(5) Decision-making information that could be used by the HN to determine how the former base camp's land might be used and further developed in the future.

(6) Information listing the POCs for questions concerning the procedures used and the tasks accomplished during base camp cleanup and closure.

d. A recommended list of contents for the archive is as follows:

(1) All components of the base camp development plan, including the base camp cleanup and closure plan and the closeout EBS.

(2) Maps, real property, construction, operation, maintenance, repair, and facility utilization assignment records of the former base camp.

(3) The RPI or the BIS that lists and describes land areas, buildings, and structures located within the base camp boundaries.

(4) Lists and records of the base camp's land management and facility-related projects and associated actions.

(5) Range and training area utilization records, if applicable, including range maps and the types of weapons fired at each range.

(6) Lists of the units, organizations, and names of POCs, as well as names of responsible officials involved in base camp development, operation, maintenance, repair, and cleanup and closure.

(7) A brief history of the base camp, including a description of the military operations that took place at the base camp and in the vicinity.

(8) Copies of real estate leases and/or use agreements, utilization inspection, and disposal reports and documents.

(9) Copies of all U.S. and HN agreement, interaction, and approval documents.

10-6. Environmental Considerations. Environmental considerations will play a large role in base camp cleanup and closure. The extent that they factor into base camp closure and cleanup will depend on agreements with the HN; laws, regulations, and treaties; and the tactical situation. While there are many environmental aspects to base cleanup and closure, certain areas will have the greatest impact. These areas include the completion of the closeout EBS, landfill and latrine closure and marking, HM/HW removal, POL removal (to include contamination), and the protection and restoration of cultural sites. See Appendix I for additional information on environmental considerations associated with base camp planning, operation, cleanup, and closure.

a. Closeout EBS. The closeout EBS documents environmental conditions as they exist at base camp closure and provides a comparison with the initial EBS performed when the base camp was established. This allows for a common frame of reference between the United States and the HN and provides for protection from liability for damages that were not caused by U.S. forces or activities. The closeout EBS should be performed by qualified environmental personnel to get the best results and may include the requirements to conduct soil and water sampling to determine the presence and type of contaminants.

b. Landfill and latrine closure and marking. When closing base camps, all landfills, latrines, and DFAC soakage pits must be closed and marked. While simple methods will generally involve only covering with earth, agreements with the HN may require more detailed methods and some form of long-term monitoring to detect potential groundwater contamination as some landfills may have been poorly constructed from the outset. In the

absence of formal guidance, best management practices must be used. This may entail enlisting environmental experts to ensure the best possible solutions.

c. Hazardous materiel/hazardous waste; petroleum, oils, and lubricants; and medical waste removal. These materials, in particular HM/HW and medical wastes, can represent a significant portion of the workload associated with base camp cleanup and closure. In particular, closure agreements may require that any spills be cleaned up before camp closure. All material not earmarked for turnover to the HN must be removed from the camp. The removal process must include proper safety measures for transportation and storage. Since the movement of HM/HW is constrained by international agreements, early planning is essential to ensure that transportation and international boundary transits can be arranged in a timely manner.

d. Cultural sites. In some circumstances, the base camp location may include sites of cultural, religious, or historic importance to the HN. In the event that damage has occurred to these sites, it is necessary to make repairs and restoration. While U.S. forces may be well-intentioned in this regard, any repair or restoration plans must include the advice and assistance of SMEs to ensure that the attempted repairs do not lead to more damage.

APPENDIX A

References

REQUIRED
These are the sources quoted or paraphrased in this publication.

Executive Order 11987, *Organic Organisms*, 24 May 1977
DD Form 1391, *FY__ Military Construction Project Data*
DOD Publication 4715.5-G, *Overseas Environmental Baseline Guidance Document (OEBGD),* 1 May 2007
UFC 2-240-10A, *Sanitary Landfill*, 16 June 2004
UFC 4-010-01, *DOD Minimum Antiterrorism Standards for Buildings*, 8 October 2003
UFC 4-010-02, *DOD Minimum Standoff Distances for Buildings*, 8 October 2003
Joint Forward Operations Base (JFOB) Force Protection Handbook, December 2006
JP 3-0, *Joint Doctrine*
JP 3-10, *Joint Security Operations in Theater*
JP 3-34, *Joint Engineer Operations*
Base Camp Facilities Standards for Contingency Operations, the Red Book
CCR 415-1, *Construction and Base Camp Development in the USCENTCOM Area of Responsibility, the Sand Book*
FM 3-0, *Operations*
FM 3-10*, Protection*
FM 3-19.40, *Internment/Resettlement Operations*
FM 3-34, *Engineer Operations*
FM 3-34.170, *Engineer Reconnaissance*
FM 3-34.400, *General Engineering*
FM 3-34.480, *Engineer Prime Power Operations*
FM 5-0, *Army Planning and Orders Production*
FM 5-103, *Survivability*
FM 5-484, *Multiservice Procedures for Well-Drilling Operations* {NAVFAC P-1065/ AFMAN 32-1072}
FM 27-10, *The Law of Land Warfare*
GTA 90-01-010, *Joint Contingency Operations Base (JCOB) Force Protection Handbook*
TM 5-634, *Solid Waste Management* {NAVFAC MO-213/AFR 91-8}
TM 5-803-1, *Installation Master Planning*

RELATED
These sources contain relevant supplemental information.

Chairman of the Joint Chiefs of Staff Manual 3122.03A, *Joint Operation Planning and Execution System, Volume II (Planning Formats and Guidance)*
JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*
JP 3-28, *Civil Support*

Text of the Basel Convention found at <http://www.basel.int/text/documents.html>
Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*
AFDD 2, *Operations and Organization*
AFDD 2-4, *Combat Support*
AFDD 2-4.1, *Force Protection*
AFDD 2-4.4, *Bases, Infrastructure, and Facilities*
Air Force Handbook 10-222 Vol. 4, *Environmental Guide for Contingency Operations,* 1 March 2007
Army Regulation (AR) 200–1, *Environmental Effects of Army Actions*
AR 405-90, *Real Estate: Disposal of Real Estate*
FM 1-02, *Operational Terms and Graphics* {MCRP 5-12A}
FM 3-07, *Stability Operations*
FM 3-100.4, *Environmental Considerations in Military Operation*
FM 21-10, *Field Hygiene and Sanitation*
Naval War Publication (NWP) 4-04, *Naval Civil Engineering Operations*
Navy Tactics, Techniques, and Procedures (NTTP) 4-04.1M/Marine Corps War Publication (MCWP) 4-11.5, *Seabee Operations in the MAGTF*
NTTP 4-04.3, *Naval Contingency Engineering Operations*
United States Army Central Command (ARCENT) Pamphlet 415-1, *Contingency Base Camp Handbook*
USACHPPM Technical Guide 230, *Chemical Exposure Guidelines for Deployed Military Personnel*, August 2001
USAREUR, *Base Camp Closure Guide*, 19 October 2005
USACE Europe District, Installation Management Activity, Europe Region, *"You Spill, You Dig II," an environmental handbook for sustained deployment operations*

APPENDIX B

Decision Briefing Format to Support the Military Decision-Making Process

B-1. Decision Briefing Format. FM 5-0 describes the doctrinal process for the military decision-making process. The accepted format is provided in Figure B-1.

1. Introduction

a. Greeting. Address the decision maker. Identify yourself and your organization.

b. Type and Classification of Briefing. For example, "This is a decision briefing. It is UNCLASSIFIED.

c. Problem Statement.

d. Recommendation.

2. Body

a. Facts. An objective presentation of both positive and negative facts bearing upon the problem.

b. Assumptions. Necessary assumptions made to bridge any gaps in factual data.

c. Solutions. A discussion of the various options that can solve the problem.

d. Analysis. The criteria by which you will evaluate how to solve the problem (screening and evaluation). A discussion of each course of action's relative advantages and disadvantages.

e. Comparison. Show how the courses of action rate against the evaluation criteria.

f. Conclusion. Describe why the selected solution is best.

3. Closing

a. Questions?

b. Restatement of the recommendation.

c. Request a decision.

Figure B-1. Decision briefing format

APPENDIX C

Sample Documents to Support Preliminary Planning

C-1. Base Camp Standards. JP 3-34 establishes the general standards and allowances for base camps, based on anticipated camp life span. The types of standards are as listed in Figure C-1.

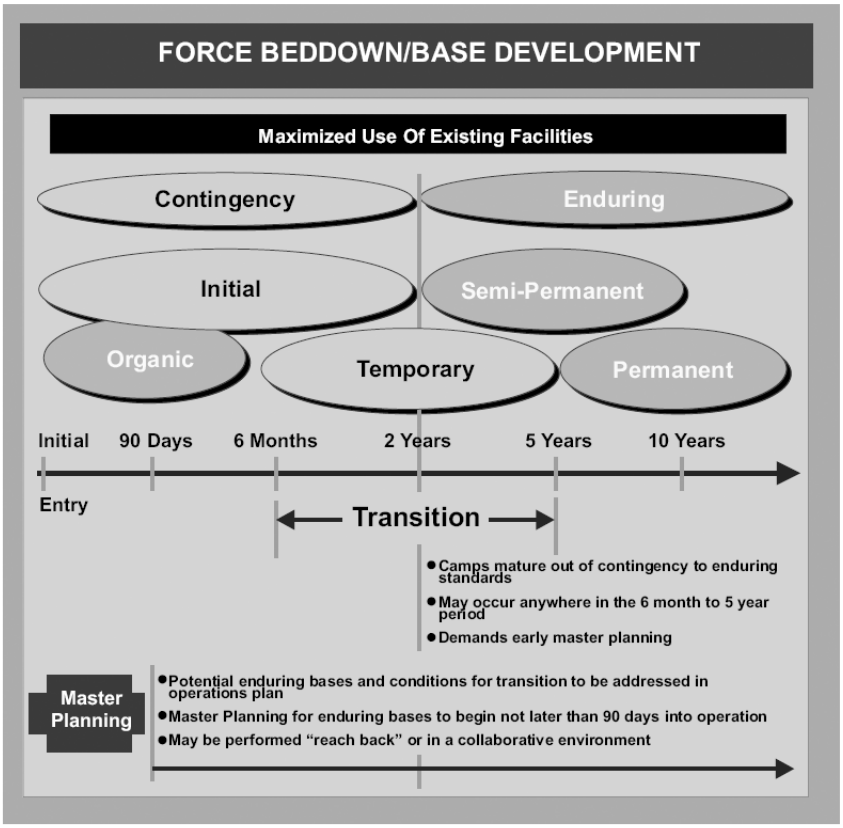

Figure C-1. Force beddown/base development standards

C-2. Base Camp Allowances. Based on the selected standard for the base camp, JP 3-34 provides for certain general allowances and facility construction standards, as shown in Table C-1, pages C-2 and C-3. These may be modified, based on the theater guidance documents, unit and operational requirements, and the commander's intent.

Table C-1. Contingency construction standards in theater

Contingency Construction Standards in Theater			
Organic Standards • Support on expedient basis with no external engineer support. • Uses unit organic equipment and systems and/or HN resources. • Mission duration typically 1-90 days. • Provides for initial force presence and maneuver activities until force flow supports arrival of engineer resources.			
Initial Standards • Characterized by austere facilities requiring minimal engineer effort. • Intended for immediate operational use by units upon arrival for a limited time ranging up to 6 months. • May require replacement by more substantial or durable facilities during the course of operations.			
Temporary Standards • Characterized by austere facilities requiring additional engineer effort above that required for initial standard facilities. • Intended to increase efficiency of operations for use up to 24 months. • Provides for sustained operations. • Replaces initial standard in some cases where mission requirements dictate. The temporary standard may be used initially if so directed by the CCDR.			
Types of Construction	**Organic**	**Initial**	**Temporary**
Site Work	Minimal to no site work; maximized use of existing facilities	Clearing and grading for facilities including drainage; revetments of POL, ammo storage, and airfield parking; aggregate for heavily used hardstands; and soil stabilization	Engineered site preparation, including paved surfaces for vehicle traffic areas and aircraft parking, building foundations, and concrete floor slabs
Troop Housing	Unit tents	Tents (may have wood frames and flooring)	Wood frame structures, relocateable structures and modular building systems
Electricity	Unit tactical generators	Tactical generators: high and low voltage distribution	Nontactical or commercial power and high or low voltage

Table C-1. Contingency construction standards in theater

Contingency Construction Standards in Theater			
Water	Water points and bladders	Water points, wells, and/or potable water production and pressurized water distribution systems	Limited pressurized water distribution systems that support hospitals, dining halls, fire fighting, and other major use
Cold Storage	Contracted or unit purchased	Portable refrigeration with freezer units for medical, food, and maintenance storage	Refrigeration installed in temporary structures
Sanitation	Unit field sanitation kits and pit latrines	Organic equipment, evaporative ponds, pits or burnout latrines, lagoons for hospitals, and sewage lift stations	Waterborne to austere treatment facilities—priorities are hospitals, dining halls, bathhouses, decontamination sites, and other high volume users
Airfield Pavements*		Tactical surfacing, including matting, aggregate, soil stabilization, and concrete pads	Conventional pavements
Fuel Storage	Bladders	Bladders	Bladders and steel tanks
*The type of airfield surfacing to be used will be based on soil conditions and the expected weight and number of aircraft involved in operations.			

C-3. Facility Requirements Factors. The types and amount of facilities required in the base camp will be driven by several factors, as outlined in Chapters 1 and 4. Some of these factors are listed in Figure C-2.

Facility Requirements Factors
• Mission and operational objectives • Total force structure to be supported • Expected duration of force deployment • Types of equipment to be employed • Number of days of supply to be stocked in the operational area • Standards of construction • Operational area medical policy • Operational area climatic conditions • Time-phasing of force deployment • Force protection (for example, AT/FP standoff distances) • Hazardous material management and waste disposal • Proximity to lines of communications • Utility requirements • Availability and suitability of existing HN infrastructure • Real property factors • Environmental restrictions • Cultural and historic sites and sensitive natural resources • Safety requirements (for example, explosive safety distances, airfield clearance, fire prevention)

Figure C-2. Facility requirements factors

APPENDIX D

Sample Documents to Support Location Selection

D-1. Location Selection Team Checklist. The location selection team checklist is provided to assist teams with the identification of major tasks that may need to be accomplished to support site selection. The sample checklist shown in Table D-1, pages D-1 through D-4, is not all inclusive, as listed tasks may or may not be applicable to a specific mission and others may need to be added as the mission evolves.

Table D-1. Sample location selection team checklist

Check	Task	By (Initial)
	PRELIMINARY	
	Tailor team to meet the situation; assign specific responsibilities, duties and team objectives, deployable and reachback designations.	
	Review the list of requirements (refer preliminary planning/mission analysis) and facility standards to roughly estimate base camp land area requirements.	
	Conduct preliminary multidisciplinary research and remote imaging analysis.	
	Study base camp site layout plans from recent deployments to estimate land area requirements.	
	Study the existing SOFA, if one exists.	
	Verify that the following coordination has occurred (if necessary):	
	Travel funding.	
	Travel arrangements.	
	Passports and visas.	
	Medical, dental, and preventative medicine clearances.	
	Diplomatic and legal clearances.	
	Administrative support.	
	Theater orientation/training, automation, and other training.	
	Logistical supplies and services.	
	Equipment.	

Table D-1. Sample location selection team checklist

Check	Task	By (Initial)
	In-country dining, living, office arrangements.	
	In-country tactical security, AT/FP, personal and property security, and crime prevention measures.	
	In-country transportation, all applicable modes.	
	Coordinate the visit to HN with the appropriate unified command and Combatant/Theater Command Field Force Engineering Liaison Officer.	
	Coordinate the visit with the U.S. DOS and invite participation.	
	If appropriate, coordinate a visit with the U.S. embassy in the HN.	
	IN COUNTRY	
	Contact U.S. representatives; make required courtesy calls and in-briefings.	
	Contact, coordinate with, and invite HN participation in the process, if appropriate. Obtain interpreters if necessary.	
	Conduct communications checks with the TeleEngineering Operations Center/EI2RC.	
	Secure and verify the adequacy of lodging, dining, transportation, and other logistical and operational needs.	
	Consult or offer assistance in developing a SOFA if one does not exist.	
	Consult or offer assistance in developing additional use agreement documents.	
	Visually inspect prospective locations by walking or driving over each land area under consideration to immediately rule out locations that will not support the mission.	
	Participate in negotiations with U.S. and HN representatives, if necessary. This should include identification of the existing condition of the land areas to be used for the base camp as well as the expected condition to which these areas will be restored when U.S. use is terminated. Conduct or arrange an EBS of each proposed base camp locations.	
	Attempt to select a minimum of three locations for the base camp from among a number of (good) alternative possibilities.	
	Compile enough information to document the task with a location selection record upon which further decision-making and subsequent planning will be based.	

Table D-1. Sample location selection team checklist

Check	Task	By (Initial)
	Major considerations for each proposed site:	
	Identify, analyze, and record all AT/FP and safety issues.	
	Identify, analyze, and record all operational and tactical issues.	
	Assess health, safety, and medical factors.	
	Assess and determine the feasibility of construction, utilities, and other resources at each potential location.	
	Special Considerations for each proposed site:	
	Soils, foundation, slope and site drainage, flooding, and seismic conditions.	
	Water supply, sanitary sewage, and industrial waste disposal.	
	Power supply.	
	Environmental policies; U.S. and HN.	
	Supports communications and information management requirements.	
	Availability and skill level of the local labor market.	
	Availability of local construction materials (especially sand, gravel, and concrete).	
	Status and availability of existing facilities.	
	Expansion potential.	
	As a minimum, verify with the HN that each prospective location—	
	Does not conflict with any HN operational or development plans.	
	Complies with HN laws, regulations, policies, and programs.	
	Does not conflict with HN cultural, sociological, political, religious, or historical infrastructure, facilities, or rules.	
	Meets with the requirements of U.S. and HN standards and agreements regarding eventual cleanup, closure, and turnover to the HN.	
	Conduct exit briefings and courtesy calls as required.	

Table D-1. Sample location selection team checklist

Check	Task	By (Initial)
	WHERE AND WHEN APPROPRIATE	
	Draft the location selection record.	
	Prepare, schedule, and conduct decision briefings as required to obtain approval of the base camp location.	
	Finalize the location selection record.	
	Ensure that all team equipment and supplies are cleaned, repaired, inventoried, and returned to the proper work/storage locations or turned in to the property book officer.	
	Ensure that team members are out-briefed.	

D-2. Information and Sources for Input. Table D-2 provides a very basic list of sources of information that will assist the team with selecting an appropriate location.

Table D-2. Example of information and sources for input

Useful Information for a Location Selection Team	
AREA OF OPERATION OR HOST NATION GOVERNMENT INFORMATION	
Country studies	Intelligence data (Central Intelligence Agency Studies)
Threat analysis	Diplomatic documents
HN policy, guidance, preferences	DOS, media
U.S. FORCES INFORMATION	
Command initiatives, preferences	Mission statement(s), timetable(s)
Force structure documents (MTOEs and TDAs) from United States Army Force Management Support Agency	Operation plans
Logistical planning requirements	Unit/mission orientation briefings
CULTURAL/GEOPHYSICAL INFORMATION	
Maps: regional, vicinity, topography	Terrain, Geological Studies
Meteorological, seismic data	Geographic Information System
Socioeconomic studies	Cultural and religious studies
Archeological documents	Environmental studies
INFRASTRUCTURE AND FACILITY DATA	
Facility inventories	Facility maps, plans and drawings
Traffic surveys and studies	Real estate documents
Utility studies	Minutes, memos, briefing slides, and such
Engineering technical studies	Route and trafficability studies

D-3. Executive Summary Location Selection Report. The executive summary of the location selection report shown in Table D-3 provides the user with a summary of the detailed report. The purpose of the report is to provide the user a description of the site selected, describing very clearly and in general terms, the primary factors considered and their impact on the decision.

Table D-3. Sample executive summary location selection report

Outline of Subject	Description and Explanation
1. Designations, purpose, and recommended site location	
2. Description of areas or communities	a. Location with references to principal nearby cities or towns. b. Population of towns and cities within a 50-mile radius. c. General area classification (agriculture, urban, desert, forest). d. General climate conditions. e. Direction of prevailing winds. f. Health conditions. g. Presence of threat by natural events such as earthquakes, volcanoes, floods, hurricanes, or tornadoes. h. Transportation facilities (airfields, highways, waterways, and railroads). i. Presence of industrial development. j. Presence of HN or U.S. defense or military establishments. k. Availability, AT/FP assessment, and suitability of existing facilities including housing that may be used by U.S. forces.
3. Description of recommended site location	a. Location. b. Estimated required land area and any land available for possible expansion. c. AT/FP and military considerations. d. Current and future impact of HN laws, regulations, procedures, and preferences affecting base camp development with emphasis on real estate and construction law.

Table D-3. Sample executive summary location selection report

Outline of Subject	Description and Explanation
	e. Estimated number of real property ownerships, both privately owned and government (HN) owned. f. Present use and improvements on property. g. Recommendations regarding restoration to former uses, or other uses, at such time as the facility is cleaned up and closed. h. Outstanding oil, gas, mineral, timber, grazing, water, and other rights. i. Terrain (general topographic features, slope of the land, vegetative cover, drainage features). j. Soil (type and depth). k. Water (nature and source of required water). l. Sewage disposal (any available existing facilities and recommendation as to disposal and/or treatment requirements and methods). m. Wastewater treatment and disposal. n. Solid waste disposal (requirements and methods). o. Electric power (available facilities and service, required construction with estimated costs and unit rates at which power can be purchased). p. Fuels (types, availability, unit cost, and estimated associated construction costs). q. Transportation (roads, railroads, inland waterways, port facilities, airports, including distances from principal population centers, highway route description, names of serving railroads, distances to rail-heads, order-of-magnitude cost of construction required to provide required transportation access). r. Presence of natural and manmade obstacles affecting construction.

D-4. Detailed Location Selection Report. The detailed location selection report is a primary component of the BCDP record. Table D-4 provides a list of subjects that should be covered in the report; however, it may be necessary to incorporate additional topics if they are considered and/or impact the selection of the site.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
1. General	Include any general remarks and also include— a. A copy of the directive(s) that established the location selection action. b. The mission statement of the proposed base camp, the description of the longevity-category of facility designs, and the projected population. c. The names, titles, and contact information of the deployed and reachback location selection team members. d. The descriptions of the alternative locations examined with a brief statement of the rationale used to recommend the best alternative. e. The concurrence signatures of the appropriate U.S. and HN officials.
2. Description of the HN	Description of the geographic, demographic, socioeconomic, cultural, and religious aspects of the HN population. Identify the nearest city or town to the potential base camp locations and the county (or province) in which they are located.
3. AT/FP Considerations	a. The strategic military and AT/FP environment. b. The AT/FP environment within the HN. c. The HN operational environment and considerations. d. AT/FP advantages and vulnerabilities of the potential locations. e. The operational advantages and limitations of the potential locations. f. Recommended AT/FP designs, practices, and procedures.
4. Description of the location and boundary	Provide a description and the approximate area expressed in acres or hectares. Include areas that could support possible expansion. Describe and analyze the following: a. Expandability. The availability of suitable land adjacent to proposed development that could be procured and developed at reasonable cost if the mission is later increased; the availability of life support resources. b. General topographic conditions in relation to requirements. Assessment of the suitability of the topography to accommodate the

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	base camp development. Also include a statement as to type and extent of grading required and a statement assuring that the topography of the location will/can meet the AT/FP and operational requirements. c. Present use. For example, agricultural grazing, residential, or unused land (desert, jungle, rock) with percentage of each type of use if there are multiple uses involved. d. Soil and foundation conditions. Nature of subsoil, particularly with reference to— (1) Soil strength and consolidation characteristics that control foundation type and construction procedures. (2) Depth to rock as affecting construction costs where trenching and grading are involved. (3) Amount of rock at surface as affecting building and grading costs; elevation and fluctuation of ground water level. (4) General character of the soil and degree to which it is self-draining, impervious, erosion or frost susceptible; soil classification and bearing capacity (CBR or K value). e. Hydrological and geological conditions and features. The location should be such that all construction can be sited beyond the "standard project flood outline", unless functions demand otherwise, such as riverfront facilities. When the location is in the flood plain of a stream or river, the hydrological data should be reported, including stream flow records, stage records, information on flood conditions and flood control works, effect of general topographic features of the area, and characteristic runoff data. The record should also include a general description of the geological formation. Identify the seismic zone in which the base camp will be located. Identify any other geological hazards; for example, volcanoes, karst (sinkhole) terrain, and landslide potential.
5. Climatologic and meteorological conditions	The type of construction and the suitability of the location for the health, comfort, and safety of personnel and the surrounding population. Provide comments for — a. Temperature: (1) Minimum of record. (2) Mean annual minimum. (3) January and July mean daily lows. (4) January and July means. (5) January and July mean daily highs.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	(6) Mean annual maximum. (7) Maximum of record. b. Precipitation: (1) Average annual precipitation. (2) Number of years for which records are available. (3) Maximum and minimum monthly precipitation (naming the months in which these occur). (4) Mean annual number of days with measurable precipitation. (5) Maximum amount of rainfall and snowfall for a 24-hour period, mean annual snowfall (measured as snow). (6) Mean annual number of days with more than 50 percent snow cover. c. Frost. Mean and maximum depth and average annual duration. d. Air movement: (1) Direction and average velocity of prevailing winds. (2) Maximum velocity and direction of winds of storm proportions (those with peak gusts of Force 11 or greater on the Beaufort scale). (3) Probable frequency of storms. (4) Frequency and duration of air inversions. e. Health conditions. The presence of swamps, mosquito breeding conditions, rodent-infested or deteriorating areas, air pollution, endemic diseases, or health deficiencies associated with the regional climate, or other factors that would affect human health or comfort. f. The record of hazardous climatic or weather occurrences; for example, tsunami, floods, tornadoes, sandstorms, hurricanes, and typhoons.
6. Real estate considerations	a. General. Detailed information on— (1) Location. (2) Estimated area of land. (3) Estimated number of ownerships within proposed base camp boundaries and information on private ownerships versus government ownerships. (4) Improvements on property. (5) Outstanding oil, gas, mineral, timber, grazing, water, and other rights. (6) Cost of acquisition, lease, damage claims, or other use fees, if applicable.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	(7) Terms of any SOFA, UN resolutions, treaties, or other like agreements. b. Local economic factors. Reconnaissance should be made to determine that there would be a minimum of infringement on the rights of others and a minimized impact on the local civilian economy. Include an estimate as to the estimated tax loss resulting from U.S. use, if applicable. c. Outstanding rights. Presence of outstanding oil, gas, mineral, timber, grazing, water, and other rights; nature of claims or subsurface rights (patented or non-patented claims, leases, options); extent of development; present status of activity (prospecting, operating, or idle); estimated area of land involved; and market value of such rights. d. Type of land (based on ownerships) and estate to acquire. DOD and DA policy relative to the type of land (based on ownership) and the minimum estate that should be acquired. e. Relocations. Identification of and estimated cost of relocation of utilities (power and telephone poles and lines, highways, railways, gas and oil pipelines) cultural, religious facilities, and cemeteries which would interfere with the use of the land area proposed for base camp development. In the case of cemeteries, cultural, or religious facilities that would become inaccessible to the HN public due to security or other concerns, state the arrangements that have been made to facilitate access or to provide alternate locations.
7. Regional factors	The following information and considerations are important: a. General. Possible effects of the development on nearby towns and the regional area during construction and subsequently, as to the capability to support U.S. military presence to include— (1) Utilities. (2) Highways. (3) Schools. (4) Housing facilities. (5) Recreation facilities. (6) Other service facilities. b. Population and locality. The analysis should include the— (1) Population of all nearby cities and towns. (2) Present land use controls and projected local development. (3) Extent to which HN zoning laws and building codes are

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	effective. (4) Economic impact of development. (5) Culture, customs, and attitudes of local citizens. (6) Impact on desired public image. c. Housing. The analysis should include— (1) Housing for any relocated population. (2) Housing for construction labor force. (3) Housing for Department of the Army Civilians, NAF personnel, contractor, and local national labor force. d. Labor. The analysis should include the— (1) Availability of skilled and unskilled labor from the HN. (2) Cost of labor (from local sources or elsewhere). (3) Extent to which laws, local/religious customs, and procedures in HN may affect efficiency and construction costs. e. Historic, cultural, religious, and archeological sites. Map and list all historic, cultural, religious, and archeological features and sites within the area. Describe the impact of construction. Include information and results of coordination with HN officials and provide recommendations to remove or mitigate any adverse effects. f. Sources and costs of construction materiel. Availability, costs, quality, and quantities of procurable materials through local sources of supply. A local source of such material may affect construction cost savings. Costs and quantities of these and other materials to be shipped from the United States or other sources of supply. Describe HN policy regarding import taxes, tariffs, and entry permits for construction materiel. g. HN resources and economic base. Assess the capability of the HN economic base to support a U.S. military presence. For example, agricultural, industrial, commercial, retail, and recreational sectors, as applicable.
8. Environmental considerations	Environmental considerations are an integral part of the location selection process. While the operational situation may often dictate the locations, whenever possible environmental considerations need to be integrated into the decision process. As a minimum, the following information should be considered or conducted: a. The presence of TIC/TIM or HM/HW hazards (including asbestos

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	and polychlorinated biphenyls. b. Industrial facilities in the area that may subject personnel to contaminants. c. Potential for dust or noise issues. d. Landfills and waste dumps in the proximity of the potential base camp site. e. Drainage both into and from the site. f. Proximity to civilian populations. g. Adequacy of space and location for HW/HW and POL storage and protection. h. Adequacy of space for latrine and gray water facilities. i. Existing environmental infrastructure such as water and sewer. j. Overall safety of existing structures on the site. k. Proximity to areas of standing water that may spread illness. l. Possible endangered species or critical habitats that may be impacted. m. Presence of historic, cultural, or religious sites. n. Appropriate environmental surveys, assessments, and reports (for example, EBS, Joint Assessment, Environmental Condition Report (ECR), and Environmental Closure Report).
9. Water supply estimated requirements	Water supply requirements for the different types of development and water demand are determined from USACE criteria and, if available, experience-based demand computations. a. Existing supplies. Analyze any existing water supply and distribution systems that could be used by the United States as follows: (1) Sources of supply. (2) Quantities immediately and ultimately available at the point of diversion to U.S. use. (3) Excess supply available and not already allocated. (4) Type of treatment. (5) Name of owner (HN government, individual, or

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	municipality). (6) Rates at which water is available. (7) Distance from base camp location to available supply. (8) Residual pressure at point of diversion from existing system at total quantity of flow. (9) Ground elevations and static pressures at points of diversion and proposed use. (10) Records of chemical and bacteriological analyses. (11) Approximate cost of construction needed to supply necessary water at required pressure. b. Well supply. If existing surface supplies cannot be utilized, then conduct a reconnaissance to determine the availability and economy of well supply should cover the following: (1) Reports on ground water resources, if available. (2) Rainfall data. (3) Reports from operating water companies procuring water from the same formations. (4) Records of available well logs, drawdown data, total pumpage from area, variations in elevation of ground water table. (5) Records of chemical and bacteriological analyses. (6) Temperature. (7) Approximate location of wells. (8) Procedure by which title to water and right to pump and transport required quantity can be secured, if such steps are necessary. (9) Approximate cost of construction needed to supply necessary water at required pressure. c. Surface supply. In the absence of existing supplies and the non-availability of adequate and economical well supplies, reconnaissance to determine the advisability and economy of a surface supply should include the following: (1) Topographic maps showing total drainage area of stream or reservoir. (2) Rainfall and run-off data (stream gauging records). (3) Survey of sources and kinds of possible contamination: - Quantity, location, and degree of treatment of sewage entering stream. - Quantity, character, and location of industrial wastes entering stream.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	(4) Records of chemical and bacteriological analyses of proposed supply. (5) Location of available reservoir locations and geological data relating to underlying formations that may affect foundation conditions. (6) Location and probable cost of pumping station, supply line, and treatment plant. (7) Procedure by which title to water and right of diversion is to be secured. (8) Approximate cost of construction needed to supply necessary water at required pressure. d. Obligations. Describe the potential fiscal or other obligations of the U.S. government as a result of base camp use of HN municipal water supplies. e. Development time. Estimate the approximate length of time required to develop adequate water supply, and resulting effect on construction procedures. f. Peculiarities. Any peculiarities concerning quantities, taste, or chemical analyses, especially if varied during different times of year. g. Summary. Summary of findings: existing supplies, well supply, and surface supply, stating which source of water should be used or developed.
10. Sewage and waste disposal	The quantities of sanitary sewage or waste materials for the different types of development are estimated at rates established by unified/combatant command and USACE standards, allowances and criteria. The analysis of the sewerage system should include the following: a. Description. Description of available waterways for receiving the treated waste flow, including their water quality standards, drainage areas, flows, characteristics, and the use made of the waterway above and below the point of discharge of treatment plant effluent. b. Terrain. Description of the terrain, including its topography and suitability for the design and the construction of collecting sewers. c. Subsoil. Description of the subsoil, including the extent of rock, ground water, permafrost, and loose soil requiring sheeting; all as affecting the cost of sewer-trenching.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	d. Existing facilities. Description, with maps and drawings, of accessible existing sewage/wastewater treatment plants, if any, giving their locations and capacities. e. Possible location(s). Statement regarding possible locations of sewage/wastewater treatment plants, including capacity for expansion of flows and treatment units, and points of discharge for treated effluent. f. Industrial waste. Statement concerning industrial waste disposal, covering the following points: (1) Description of local regulations effecting disposal of industrial waste into streams. (2) Determination of effects of disposal of proposed industrial waste. (3) Description of possible contamination of underground water supplies if lagoons are proposed for waste disposal. (4) Possibility of using evaporative methods where climatic conditions permit. (5) Adequacy of area for disposal of toxic materials. Adequacy of area for containment, storage and/or treatment prior to controlled disposal of toxic materials by an approved method. g. Type of treatment. Recommendation as to the degree and type of treatment that will meet the requirements of the command, the HN, and local health officials with recommendations as to the disposal of effluent and a rough estimate of the cost of installing the type of treatment recommended. h. Solid waste. Statement concerning proposed methods of solid waste disposal; for example, sanitary landfill, incineration or, if feasible and appropriate, through HN municipal or regional systems. i. Infectious waste. Description of how infectious waste will be handled and disposed.
11. Air pollution control	The analysis should cover such air pollution considerations as combustion of fuel, sulfur oxides, stacks, storage and handling of fuels and ash, solid waste disposal, and other pollution producing processes in relation to air pollution standards.
12. Transportation facilities	Transportation is the backbone and vascular system of military operations and logistical support. Even if certain other parts of this record are either not applicable or cannot be completed, a detailed transportation assessment is imperative.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	a. Highways. Assess and describe the adequacy of highways with emphasis on the MSR, railheads, harbors or other transportation centers, existing primary highways in relation to location of the proposed base camp. Describe type and condition of existing surfacing, width of existing surfacing, shoulders and right-of-way, extent to which bridges are posted for limited loads or for inadequate width/height of clearance. Data on each bridge or grade separation structure to include type, capacity, horizontal and vertical clearances. b. Local roads. Adequacy of roads from adjoining towns or from the primary highway system over which an appreciable volume of construction material may be hauled. If such roads are other than those referred to above, furnish additional information. c. Volume. State the approximate average and peak hourly traffic under present conditions, the estimated average daily and average peak hourly traffic flow during construction of the base camp, and the estimated average daily and average peak hourly traffic during subsequent normal operation of the base camp. d. Required repairs and improvements. Describe any requirements for reconstruction of existing highways or construction of new highways to bypass the present location or to replace any public roads that need to be closed. Describe other desirable, but not essential, highway adjustments or improvements, such as overpasses or underpasses. e. Loads and types of vehicles. Describe the roads that would have to be traversed between cantonment (built up) areas of the base camp and areas of tactical operations, isolated firing ranges, or maneuver areas. Include a definite statement as to the adequacy of the highway system within a radius of approximately 200 miles of the base camp location with reference to supporting military wheeled vehicles. Recommend ways to segregate wheeled from tracked vehicle operations. State the types of pavement (for example, concrete, high-type bituminous concrete, or light macadam, sand, clay, or other light, flexible surfaces). Identify routes that require strengthening to carry military traffic. f. Roads within the base camp area. Assess roads from public highways to the location and roads within the location to include the following:

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	(1) Estimated length, required type of construction, and estimated cost for roads to provide access between the location and existing public highways. (2) Existing roads within the boundaries of the proposed base camp that are presently adequate to support use by motorized equipment. (3) Estimated locations and costs of new roads between the cantonment and any training areas. (4) Policies and preferences of HN officials regarding the closure of existing roads. (5) Requirements and recommendations as to highway specifications for primary and secondary roads. (6) Availability and suitability of materials for road construction. (7) Size, estimated cost, and number of bridges that must be repaired or constructed. (8) Extent of temporary work needed to initiate base camp construction, pending provision of permanent access roads and connecting railroads. (9) Estimated cost of road work necessary on part of local authorities, and estimated cost of work to be financed from construction funds. g. Railroads. The analysis of railroads and rail accessibility, if applicable, should cover the following: (1) Name of serving railroad with which connection can most conveniently be made. (2) Name of second railroad with which connection can be made, where volume of traffic necessitates, or where proximity warrants better rates or improved service. (3) Location and distance of nearest station, freight office, and post office from location. (4) Adequacy of existing railroad to handle construction materials and subsequent freight traffic. (5) Estimated length of access line to the location, weight of rail, rail gauge, quantities and kind of grading, with a statement of construction difficulties to be encountered. Include highway crossings and drainage structures needed to provide satisfactory alignment and grade to reach location. (6) Estimated total cost of access railway and total cost to the U.S. government. This information should be supported by topographic data. (7) Maximum degree of curve and percent of grade; also

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	elevation at main line and at the terminal(s). (8) Grade crossings (existing and proposed) in connection with public highways, desirability for constructing grade separations, and the estimated cost of such work. (9) Data on any bridges which may be required, with spans and estimated cost. (10) Justification of rail service compared with other methods of delivery, based on cost of construction and operation, anticipated volume of traffic, and military necessity. In the case of small facilities such as internment camps and field hospitals, rail connections to the location may not be feasible. h. Ports, harbors, and inland waterways. The analysis should cover the following: (1) Anchorage areas. (2) Storage facilities. (3) Berthing facilities. (4) Port clearance facilities. (5) Materials handling equipment at dockside (including gantry, floating, or other dockside cranes). (6) Repair yards. (7) Safety gates. (8) Navigational hazards. (9) Bottom and beach characteristics. (10) Lock location and description. (11) Channel characteristics. (12) Tides and currents. (13) Meteorological conditions. (14) Volume and capacity of daily traffic movement (throughput). i. Existing airports and airfields. Aviation access almost certainly is or eventually will be required by U.S. forces. This is an area of the transportation analysis that should rely on expert assessment, preferably by aviation planners and experienced aviators. If possible, also consult with United States Army Aeronautical Services Office, the United States Air Force, and any HN aeronautical agencies in the process. The analysis should cover the following: (1) Location. (2) Type and number of access facilities. (3) Characteristics and dimensions of runways and aprons.

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	(4) Locations, size, and number of hangars. (5) Administrative facilities. (6) Storage facilities for aircraft parts and equipment. (7) Aircraft fuel storage and dispensing facilities. (8) Volume and possible capacity of air traffic. (9) Potential locations for airfields and/or heliports. (10) Meteorological conditions. (11) Airfield and heliport suitability. All factors not fully covered elsewhere in the record that may influence selection of an airfield location should be covered. Also, any factor covered elsewhere, which because of its significance would materially affect airfield or heliport construction, should be analyzed. (12) Flying conditions. Any factor that may restrict flying activity should be covered. The analysis should include the following: (a) Obstructions and hazards to air navigation. (b) Proximity to firing ranges, ammunition depots, areas of population, aviation-prohibited or restricted areas, or civil airways. (c) Airspace responsibilities and procedures.
13. Traffic management factors	The analysis should include the following: a. Types of carriers available (railroads; carriers by water and motor vehicle; freight forwarders; express services—air, rail, and motor; airlines and helicopter services; and pipelines). b. Constriction or choke points and methods to be used to minimize or eliminate them. c. Quality and quantity of service by mode (adequacy, flexibility, frequency, reliability, and speed). d. Movement facilities (location and capacity of railroad yards; freight houses; equipment; for example, freight cars, switching locomotives, barges or vessels, trucks, track scales, deicing facilities, and loading ramps; track connections, existing or possible; and local transit, pickup and delivery). e. Accessorial services (transit, reconsignment, switching, weighing, dockage and wharfage, and refrigeration). f. Availability of passenger services (individual and troop units). g. Cost of transportation (rates on raw materials and finished products, as appropriate; charges for accessorial services; handling

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	and warehousing cost, charges for disposing of waste material, if any; and rate relationships).
14. Drainage and erosion control considerations	The analysis, based on an on-location reconnaissance, should include the following: a. Topography, size and shape of drainage area, and extent and type of anticipated area development. b. Capacity, elevation, and condition of existing drains, channels, or waterways that will be affected. c. Climatic conditions, particularly precipitation characteristics, as related to runoff. d. Soil conditions relating to erosion and infiltration rates. e. Outfall and downstream flow conditions, including high-water occurrences and frequencies. f. Effect of proposed drainage construction on local interests' facilities, and evaluation of local interests' requirements that will affect the design of the drainage system. Consideration should be given to probable effects of runoff diversions or of adverse effects on water quality from disposal of drainage in waterways.
15. Power and fuel considerations	a. Electrical distribution systems. (1) Existing transmission or distribution line location in relation to the location, including distance and direction, name of owner and local official, and location of power generating sources (show on map). (2) Capacity, voltage, and operating frequency of transmission or distribution line and capacity available to location. (3) Reliability of power supplies, indicating number and duration of power interruptions during the past 2 years. (4) Rate information, showing demand and energy charges and average cost per kilowatt hour. (5) If electric line extension to location will involve expenditure of U.S. government funds, give estimated amount and costs of required facilities, and state extent of HN participation. b. Heating fuel. The fuel selected from those which are available depends on the planned life of the facility, and the following considerations: (1) If coal is selected, the analysis should include the cost of coal per short ton delivered to the development; cost of handling,

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	storage and issue; ash handling and removal cost; and the cost of providing a storage area. The 'as received' heating value of the coal in BTU per pound should be furnished on the basis either of coal currently used in the area or representative analyses from mines from which the coal will probably be procured. (2) Fuel oil is not normally available from a pipeline and must be brought to the location by tank car or tank truck. The costs to be considered are cost per gallon of the fuel oil; the heating value of the fuel oil in British thermal unit (BTU) per gallon based on the commercial number designation of the oil and/or its specific gravity at 60 degrees Fahrenheit; the cost of storage tank(s); the cost of pipeline to the storage tank location where applicable; and the cost of transportation, pumping, storage, and issue. (3) Gas may be selected if the supply is adequate, and when all factors are considered, including initial cost, manpower requirements, operating and maintenance requirements, is found to be the most economical fuel. As a rule, the availability and cost of manufactured gas prohibits its use. Natural gas should be considered only when the line required to supply the development is short, is secure, and the general site layout of the base camp avoids an extensive distribution system serving small loads in isolated locations. (4) Liquid petroleum gas should not be considered for use unless the refining source of supply is within a one-day trucking distance of the base camp. Safety procedures for handling are absolutely essential. Central storage should be provided with delivery either by tank truck to smaller service tank locations or by distribution piping. The following information, as applicable, should be supplied where gas or oil is available and proposed for use: (a) Distance to, size of, and pressure in nearest pipeline or point of supply. (b) Maximum amount of gas or oil that can be supplied. (c) Available reserves for 10-year demand. BTU content of gas or grade of oil. (d) If a new pipeline and/or other facilities must be built to bring a sufficient quantity of gas to the boundaries of the location, give length, size, time of connection, and approximate cost of line and other facilities that must be constructed at government expense. (e) Determine extent to which gas company will cooperate in providing necessary extensions that will provide adequate

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	supply at minimum cost to the government. Pressure of gas that the company can maintain at point of delivery at boundary of location. (f) Names and addresses of utility companies supplying gas. (g) Rates at which gas can be procured. Character of soil in area through which proposed gas lines must be installed.
16. Communications considerations	a. Telephone service. (1) Accessibility to major lines of communication. (2) Proximity to government-owned radio communications. (3) Line and trunk characteristics and capacity of existing telephone facilities and outside plant and ability to accommodate the increased load without expansion of facilities. (4) Estimated cost of expanding the facilities to accommodate the anticipated load, and subsidization expected from the government. (5) Capacity of local telephone company exchange and ability to handle increased traffic on short notice. (6) Rate information. (7) Summary of capability and capacity to support of U.S. uses. b. Radio/satellite communications. (1) Documentation showing the measured RF noise and signal levels existing at the proposed antenna location or data necessary for computation of these levels. (2) Plan of proposed antenna fields and its relationship to other facilities. (3) Suitability of the surrounding terrain for microwave and satellite links including profile charts. c. Communications systems safety and security analysis should address: (1) Data demonstrating that electromagnetic radiation from existing nearby equipment will not violate criteria for personnel or material. (2) Data to demonstrate that proposed equipment will not violate electromagnetic radiation vulnerability criteria for personnel or material. (3) Deficiencies and potential vulnerabilities regarding communications security.
17. Conclusions and recommendations	The conclusions reached as a result of the reconnaissance are briefly summarized to indicate—

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	a. Summarize the AT/FP environment within the HN and at the recommended base camp location. Recommend the security level, security procedures, facility and infrastructure designs, and the degree to which the HN local population should be involved in the action. b. The unique engineering and construction features of the location, the features particularly favorable to economical construction, and those which would adversely affect it. c. The individual topographic conditions satisfying or not satisfying the criteria to be met for the applicable type of development. For example, if ranges and training facilities are required, are terrain and vegetative cover conducive to construction and operation of such facilities. d. A general, brief comparison with other locations under consideration. e. A description of the feasibility, acceptability, and suitability of the recommended location as they pertain to the primary purpose of base camp. f. Describe any HN construction laws, regulations, policies, or customs that could impede development and operation. g. Describe adjustments that may be needed to military requirements to accommodate HN and local requirements. h. Provide assurance that the proposed land acquisition covers minimum essential needs plus expansion capability and will support and enhance mission accomplishment.
18. Exhibits	The exhibits attached to the location selection record should include, as a minimum, the following: a. General location maps. b. Property ownership maps. c. General topographic maps (Army Map Service Military Editions, enhanced satellite or aerial photos, or others, if available). d. Recommended environmental plans, standards, and practices to

Table D-4. Example of a detailed location selection report

Outline of Subject	Description and Explanation
	be used during construction and by initial base camp occupants (approved by the appropriate commander prior to the start of construction). e. Maps showing transportation facilities. f. Maps showing existing utilities (power, access roads, gas lines). g. Aviation charts (if available). h. Plan showing broad land use concepts. Based on established and approved facility allowances of the base camp, a schematic or concept plan overlay should be prepared. The objective of this plan is to demonstrate that sufficient land area is available to support the mission of the base camp as well as known and any unforeseen future expansion. The plan may be based on available remote surveys, topographic maps, or CADD layers to include topography. The plan overlay or layer will show, in broad, general fashion, the recommended groupings of proposed land uses in relation to the surrounding areas and connecting transportation facilities.

APPENDIX E

Sample Documents to Support Land Use Planning

E-1. Land Use Plan Options. A land use plan can be completed using various methods. Figure E-1 and Figures E-2 and E-3, pages E-2 and E-3, show some of the most common methods used to produce the plan: CADD software, manual drafting, or readily available desktop software.

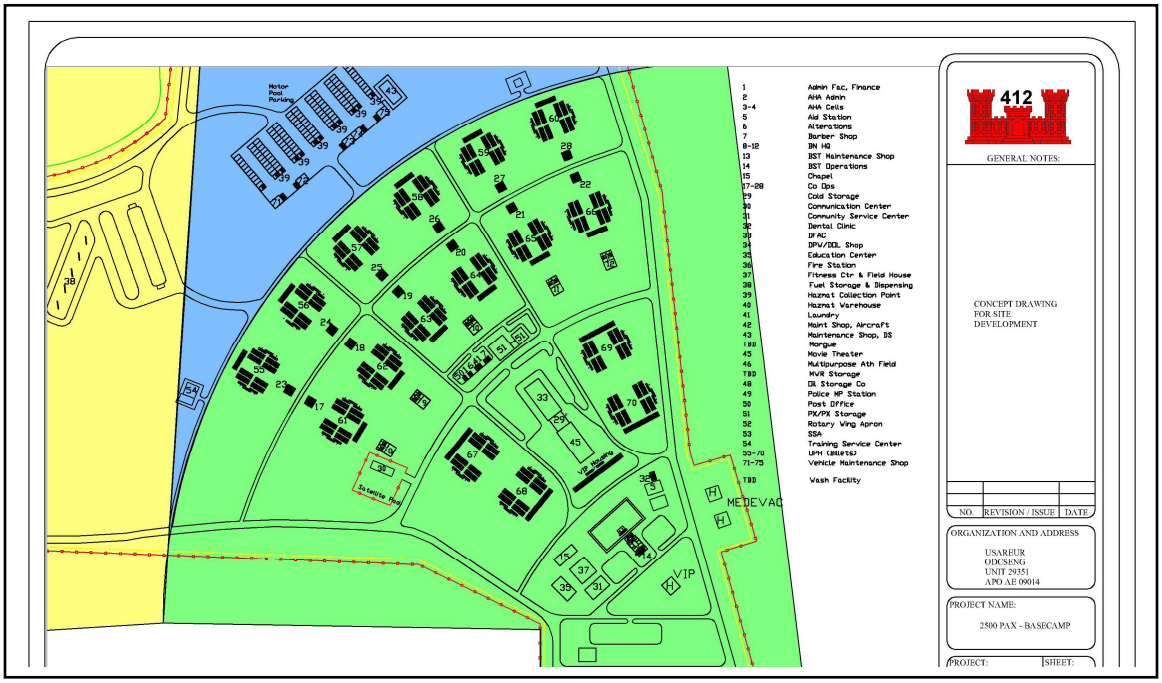

Figure E-1. Land use plan (color-coded, using CADD software)

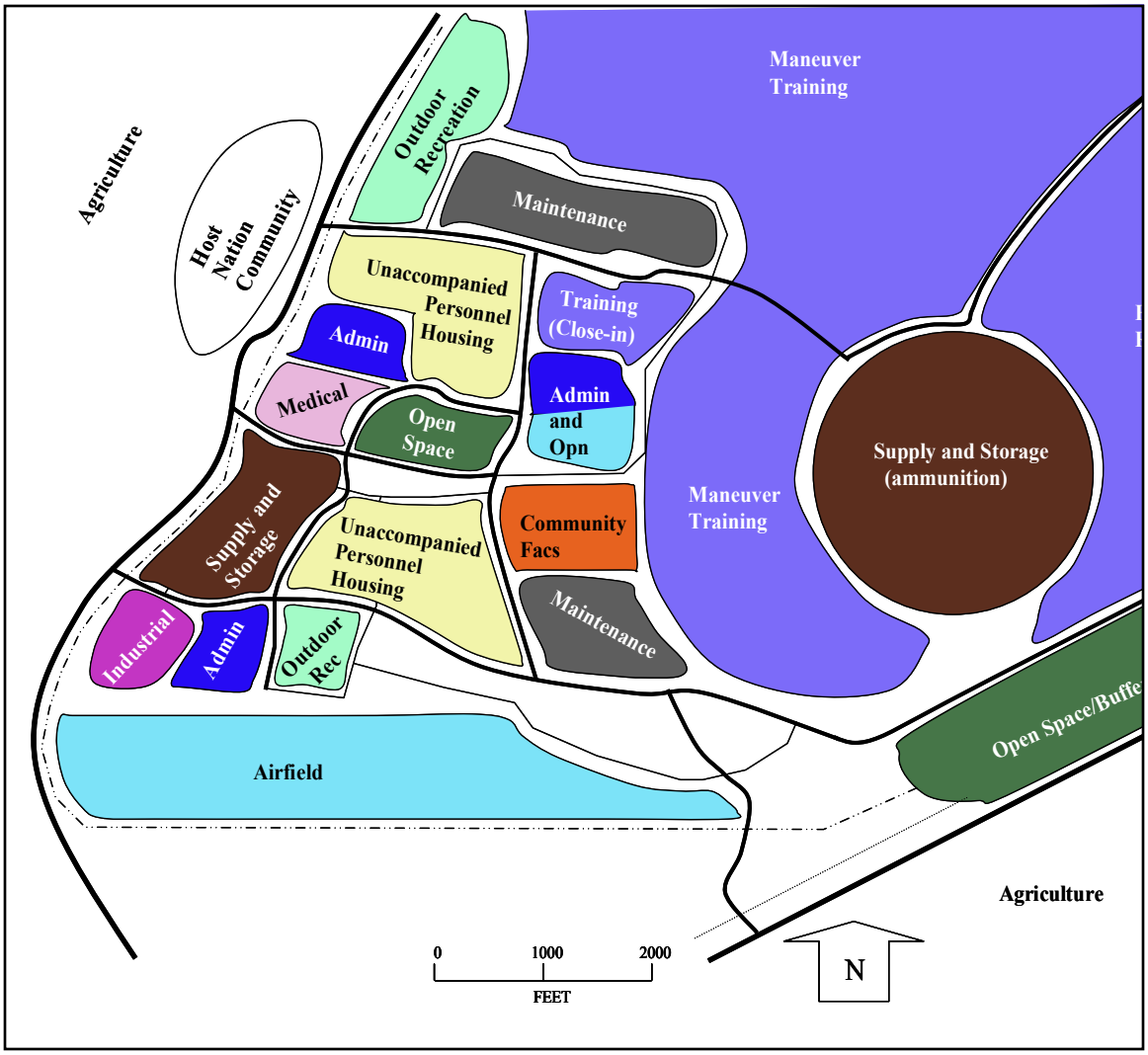

Figure E-2. Land use plan (manual drafting method)

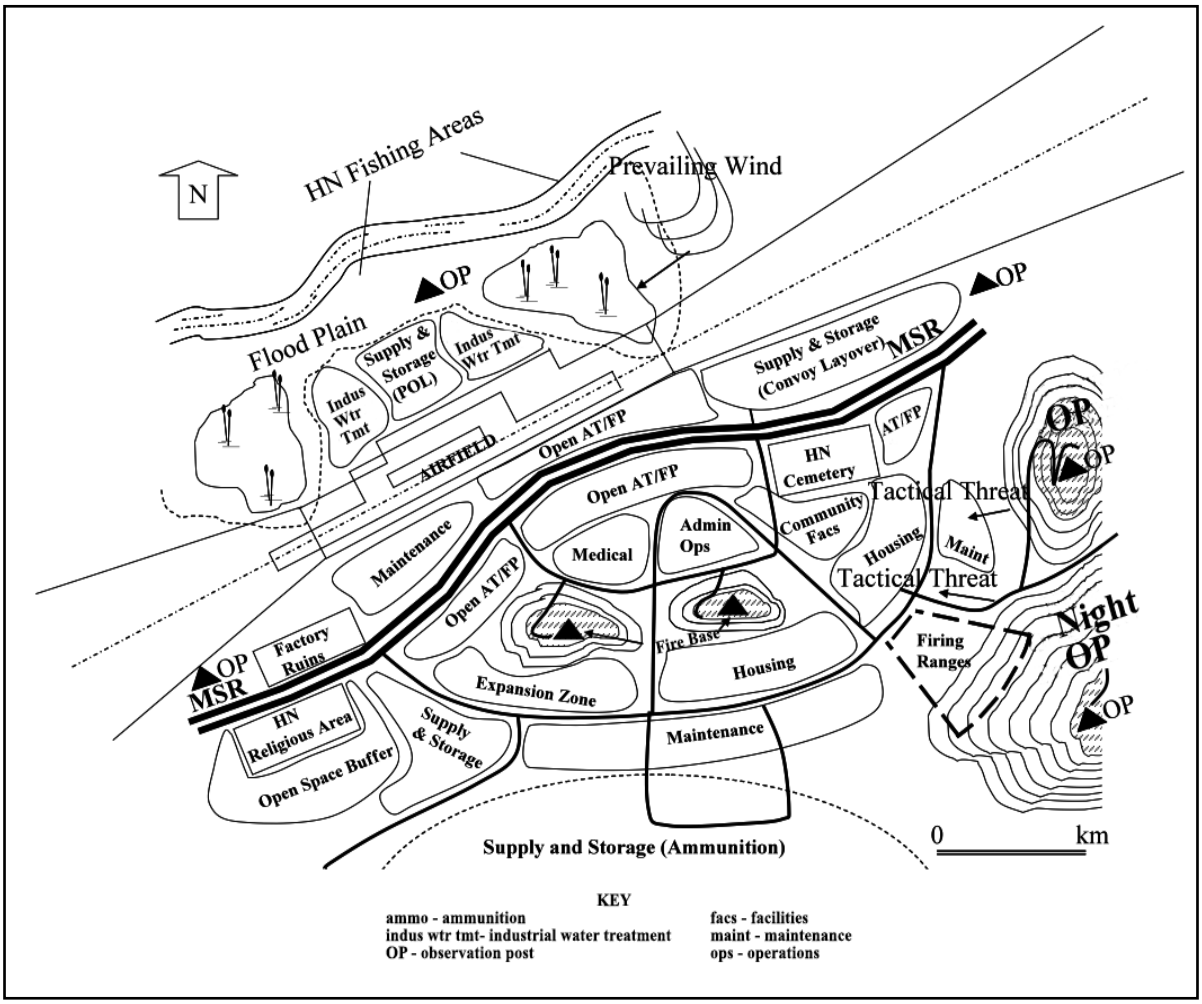

Figure E-3. Land use plan (desktop graphic software)

E-2. Land Use Plan Checklist. The land use plan checklist shown in Table E-1 provides some basic parameters that should be considered to optimize the land use plan.

Table E-1. Sample land use plan checklist

Land Use Parameter	Analyze the COA To Ensure That—	Initial
FOR THE EVALUATION OF EACH COA FOR LAND USE		
1. Size	The (total) land area is of adequate size and dimensions, including expansion capability, to support the current mission and both anticipated and unforeseen expansions.	
2. Associations	Other land uses essential to the efficient functioning of activities or facilities associated with a particular land use have been addressed in the planning.	
3. Interactions	The nature of the interactions (kind, frequency, importance of flow) between the different land uses has been researched and incorporated. Command guidance and preferences have likewise been incorporated.	
4. Adverse Influences	External effects associated with a land use that would adversely affect another adjacent use have been identified and mitigating actions recommended. For example, heavy vehicular traffic into one land use area might cause this traffic to flow through an adjacent land area where it would create a disturbance and a safety problem. Rerouting this traffic around the second area would mitigate the potential problem.	
5. Location	Land uses that are "footloose" in terms of dependencies on other land use areas have been located in relatively independent areas. Land uses have been identified which have a specific location requirement relative to site suitability.	
6. Challenges and Opportunities	The functional relationships overlay has been examined to see if related land uses or similar activities are located too far from each other, where compatible activities can be consolidated, and where "stray" individual functions may be located too far away from the functional area most closely related to them. Proper use of prominent terrain features offers the opportunity for increased tactical capability, AT/FP, and potential site locations for prominent facilities; for example, major unit or base camp headquarters, or recreational facilities.	
7. Security	Safety, personnel and property security, and AT/FP considerations have been included.	
8. Combination	Land use zones will facilitate a combination of functionally related or compatible uses into single structures or complexes, where feasible.	

Table E-1. Sample land use plan checklist

Land Use Parameter	Analyze the COA To Ensure That—	Initial
9. Disposal	The plan is organized so that base camp cleanup and closure (or turnover to the HN) can proceed in an orderly, sequential, incremental, or concentric fashion when the U.S. mission is completed.	
10. Environmental	The recommended COA accommodates constraints imposed by environmental factors. Areas that should not be developed are clearly delineated.	
11. Conservation and Preservation	The important characteristics of the base camp and its resources that should be taken advantage of, or preserved, have been considered.	
12. Infrastructure	Transportation and, possibly, main utility considerations are delineated on the plan.	
FOR THE EVALUATION OF THE SELECTED "BEST" COA		
Parameter	**The Selected Plan Provides—**	**Initial**
13. Open Space	Maintenance of open areas outside the built-up area for training activities, maneuvers, and required operational and AT/FP setbacks and clearances.	
14. Separation	Separation of uses with different intensities of activity and separation of functions requiring special security considerations.	
15. Grouping	Grouping of compatible functions in areas intended for multiple uses.	
16. Adjacency	Land uses with important functional relationships have adjacent locations.	
17. Clearances	Conformity to operational safety clearances and noise criteria.	
18. Expansion	Allowance for anticipated and unanticipated expansion within land use areas.	
19. Use of Positive Natural Features	Use of natural features and terrain to provide an attractive setting for living areas, recreational areas, and other community functions.	
20. Access	Convenient access to troop support and community facilities.	
21. Road Access	Accessibity to primary roads for land uses generating high traffic volumes.	

E-3. Goals and Objectives Statements for a Land Use Plan. Figure E-4 shows an example of goals and supporting objectives statements to assist the planner in developing a comprehensive strategy for a land use plan.

Goal 1. Provide real property support for successful accomplishment of assigned base camp missions.

(a) Objective. Ensure that sufficient training ranges, facilities, and maneuver areas are available on a continuing basis, having them operational by 1 February 20xx.

(b) Objective. Develop and implement a Range and Training Land Program Development Plan not later than 15 November 20xx.

(c) Objective. Support and assist assigned units in achieving their sustainment training goals on a continuing basis; complete development of a classroom and a close-in nonfiring training area by 30 September 20xx.

Goal 2. Set aside sufficient land area for expansion to support both anticipated and unforeseen missions and other changes.

(a) Objective. Provide sufficient expansion area to house two additional interim brigade combat team combined arms battalions projected to arrive on or about 31 December 20xx; ensure that the plan is complete and approved by 31 August 20xx.

(b) Objective. Unstable conditions in _____ may lead to a large number of refugees crossing the border into the vicinity of Camp X-Ray. This mission has not been assigned to Camp X-Ray at present, but it is anticipated. Therefore, ensure sufficient land area to house a displaced persons camp for 5,000 persons in the current land use plan; ensure that the plan is completed and approved by 31 August 20xx.

(c) Objective. Analyze and plan for presently undefined force structure and mission changes, leaving room for expansion within individual land use allocations in the current land use plan; ensure that the plan is completed and approved by 31 August 20xx.

Figure E-4. Example of goals and objectives statements for a land use plan

E-4. Land Use Planning Factors. Table E-2 provides some initial planning factors to assist the planner with calculating land area requirements for an HBCT-sized element.

Table E-2. General Base Camp Land Use Planning Factors

Land Use	Area (in acres)	Suggested Range (in acres)	Facilities Included	Remarks
Industrial	155	150-160	Wastewater treatment, electrical generation, incinerator, vehicle maintenance	
Community/ Administrative	99	90-110	Medical, fire and rescue, postal, dining, headquarters, briefing/chapel, parade field	
Troop Housing	230	225-250	Housing, showers, latrines, bunkers	Includes expansion capability (surge areas).
Supply/Storage	453	430-460	Military vehicle parking, wash racks, ammunition storage, open storage	
Morale/Welfare/ Recreation	65	50-75		
Heliport Facilities	129	110-130	Heliport aprons, tie-down area, maintenance hangar, operations, control tower, available fuel storage and truck parking, radar site	This is for a heliport of 12 helipads. If only one helipad is needed, less land would be required.
Open Space/Buffer	703	650-850	ECPs, guard towers, AT/FP buffers	Includes 350 acres of clear space outside the security fence.
Contractor Area	108	75-150		

E-5. Environmental Overlay. Figure E-5 depicts a basic example of an environmental overlay used to supplement the land use plan.

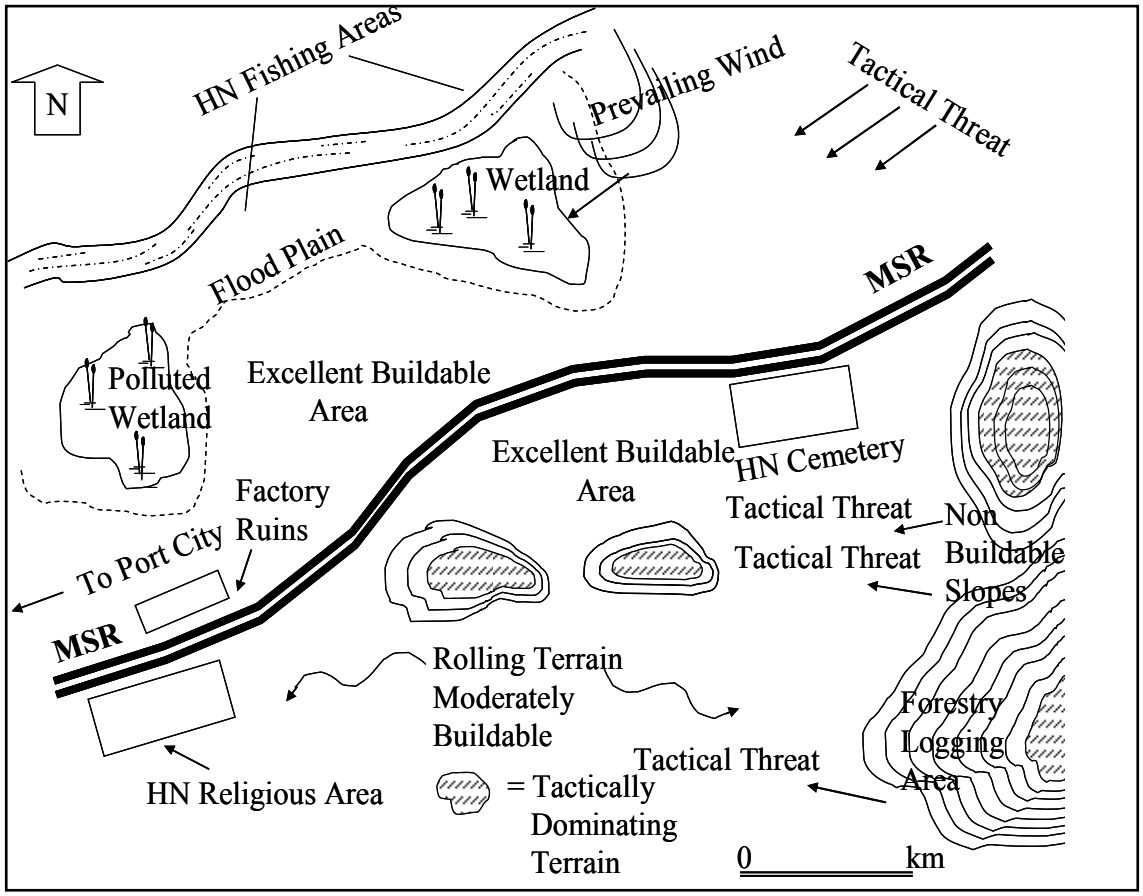

Figure E-5. Example of an environmental overlay

E-6. Land Use Compatibility. Table E-3 and Figure E-6, page E-10, show two methods the planner can use to assist in determining or verifying the compatibility of land use functions.

Table E-3. Example land use matrix

Land Use Categories Evaluated	Administration	Commercial Services	Community Facilities	Family Housing	Maintenance	Manufacturing and Production	Medical/Dental	Operations	Recreation	Research/Development/Testing	Research Land/Buffer	Supply Storage	Training	Troop Housing	Utilities	Water Areas	Wetlands
Administration																	
Commercial Services	O																
Community Facilities	O	O															
Family Housing	■	▲	O														
Maintenance	■	■	■	■													
Manufacturing and Production	■	■	■	■	O												
Medical/Dental	▲	O	▲	▲	■	■											
Operations	■	■	■	■	O	O	■										
Recreation	O	O	O	O	■	■	O	■									
Research/ Development/Testing	▲	O	■	■	O	O	▲	■	▲								
Research Land/Buffer	O	O	O	O	O	O	O	O	O	O							
Supply Storage	▲	■	■	■	O	O	■	■	▲	▲	O						
Training	■	■	■	■	■	▲	■	■	▲	■	O	▲					
Troop Housing	▲	O	O	■	■	■	▲	■	O	■	O	■	■				
Utilities	▲	▲	▲	■	O	O	■	▲	▲	▲	O	O	■	■			
Water Areas	O	O	O	O	▲	▲	▲	▲	O	■	O	■	■	O	■		
Wetlands	■	■	■	■	■	■	■	■	O	■	O	■	■	■	■	O	

O Compatible ▲ Neutral ■ Incompatible

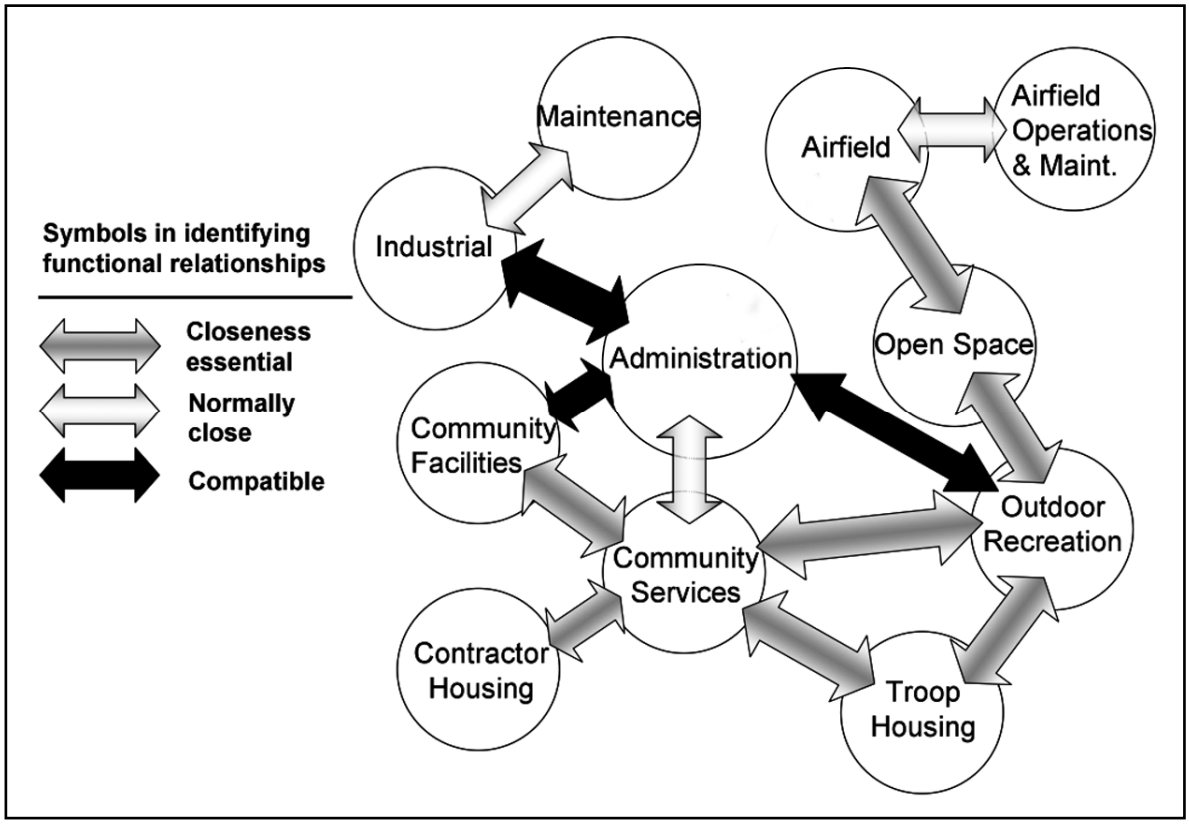

Figure E-6. Example affinity relationships diagram

E-7. Functional Relationship Overlay. To confirm the compatibility of functional areas of a land use plan, the planner can develop a functional relationship overlay like the one shown in Figure E-7. A comparison of the overlay with the land use matrix or affinity relationships diagram will assist the planner in identifying noncompatible uses.

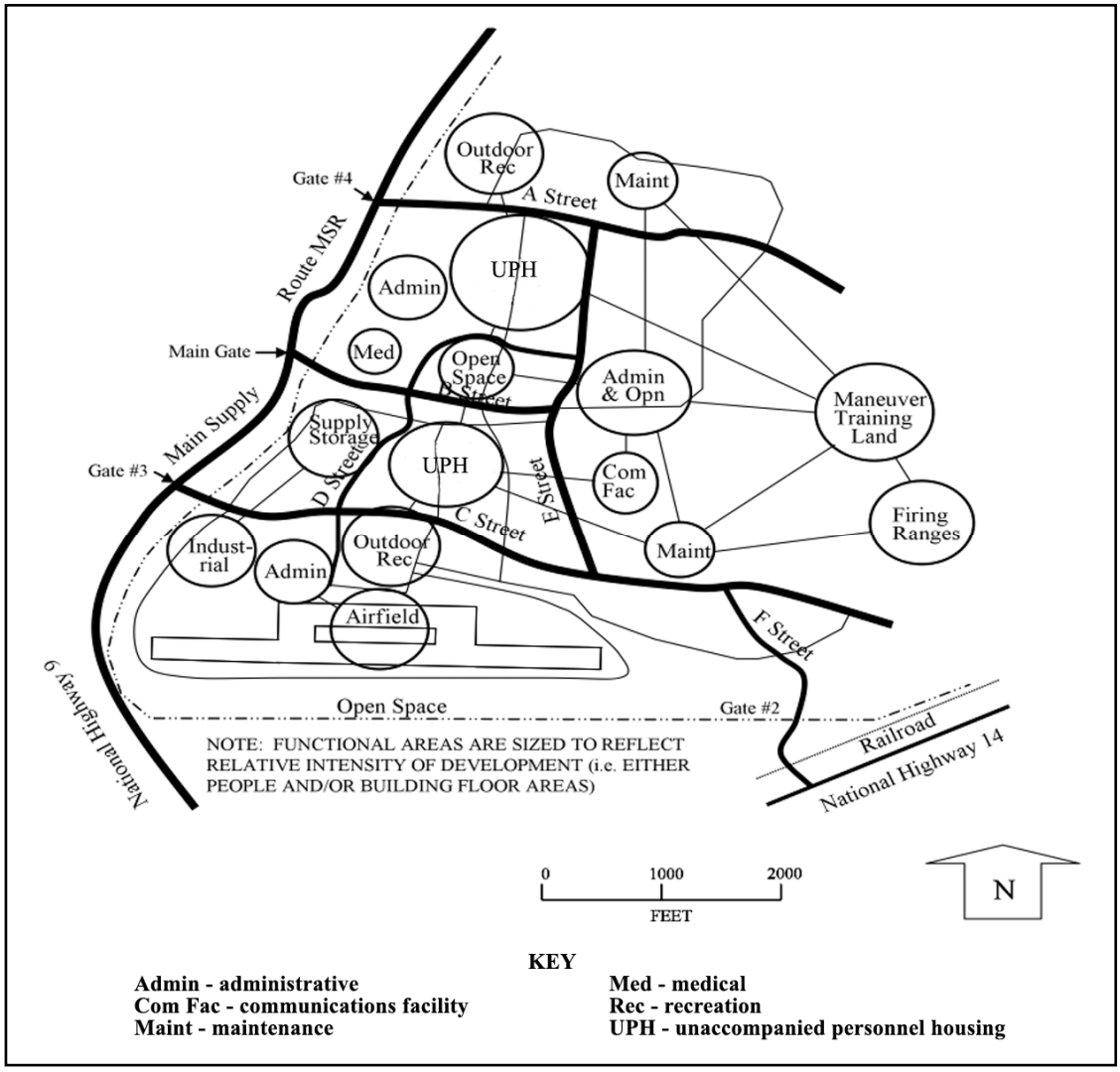

Figure E-7. Example functional relationship overlay

E-8. Analysis Overlays. Figures E-8 and E-9 and Figure E-10, page E-14, show the most common overlays designed to assist with the various analyses that are necessary to develop a successful land use plan.

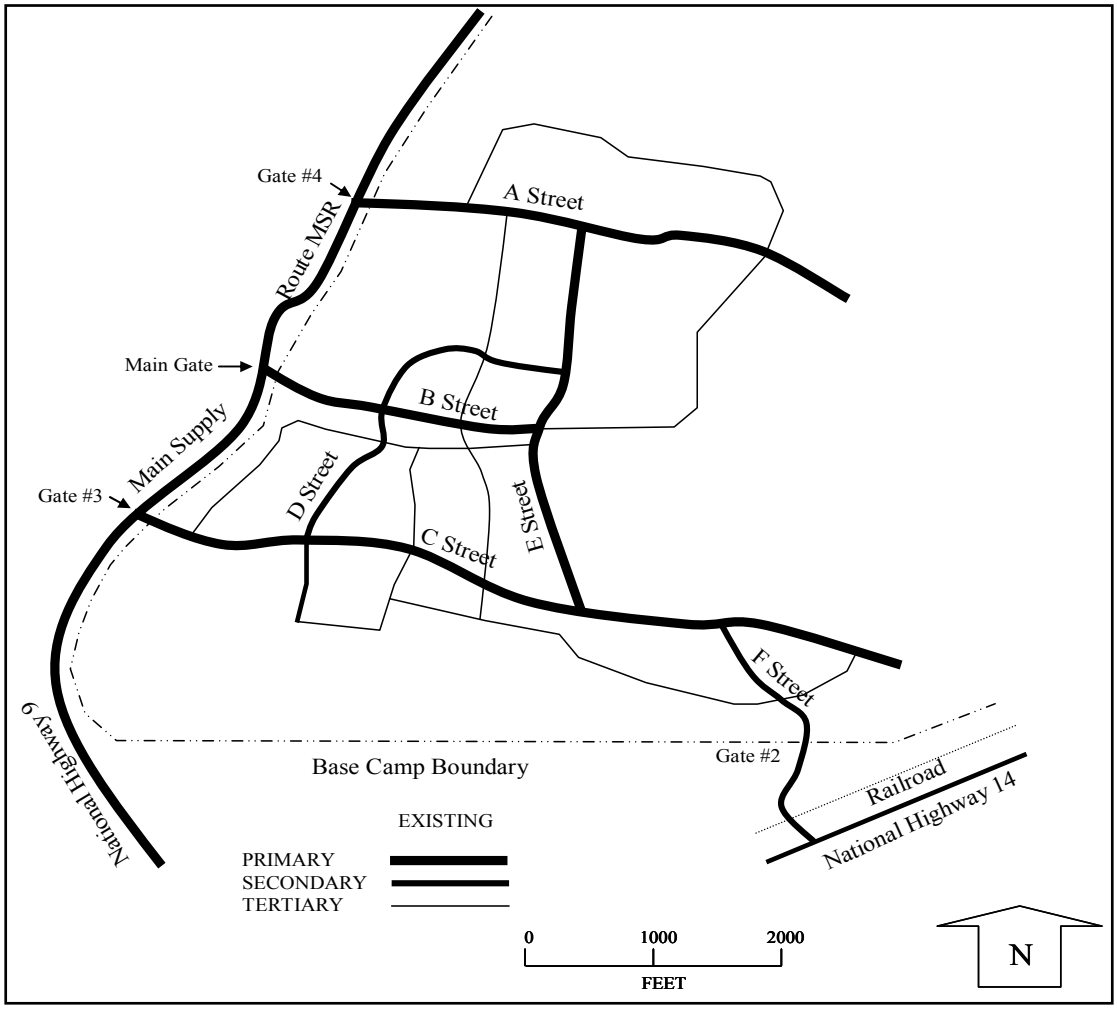

Figure E-8. Example circulation systems analysis

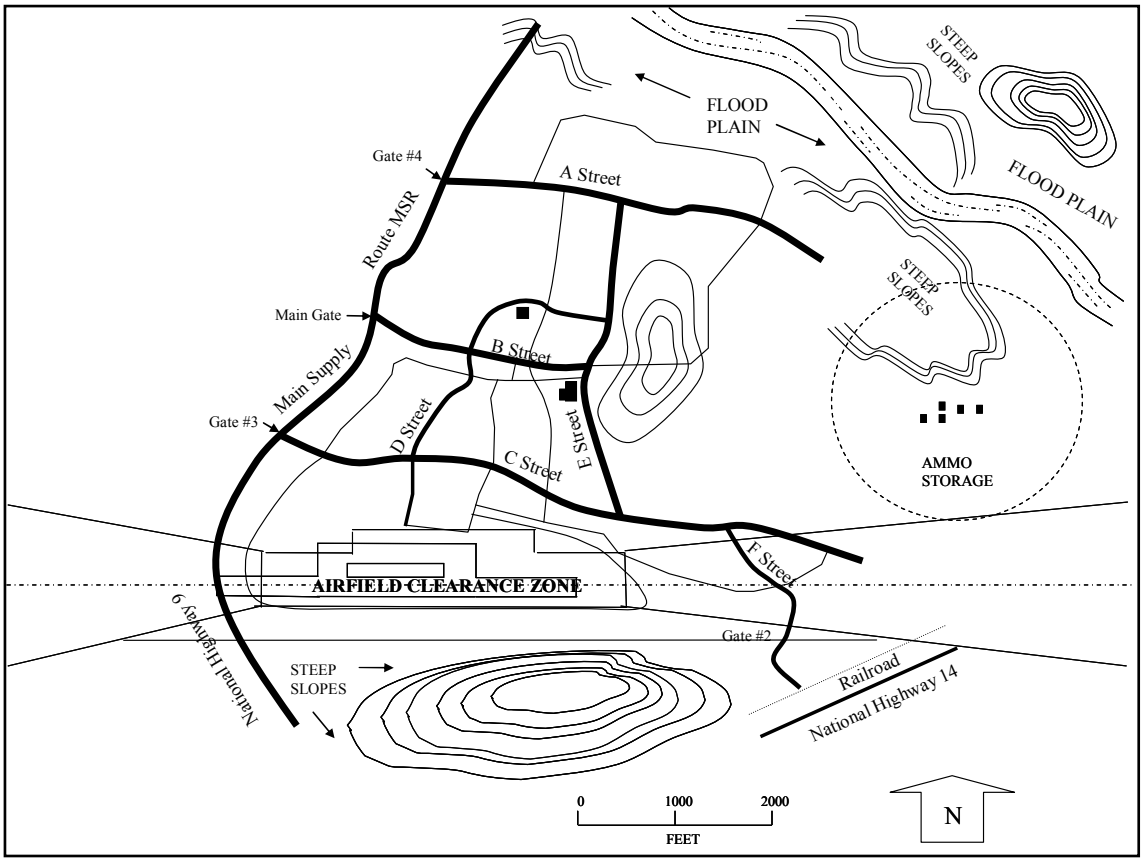

Figure E-9. Example buildable areas analysis

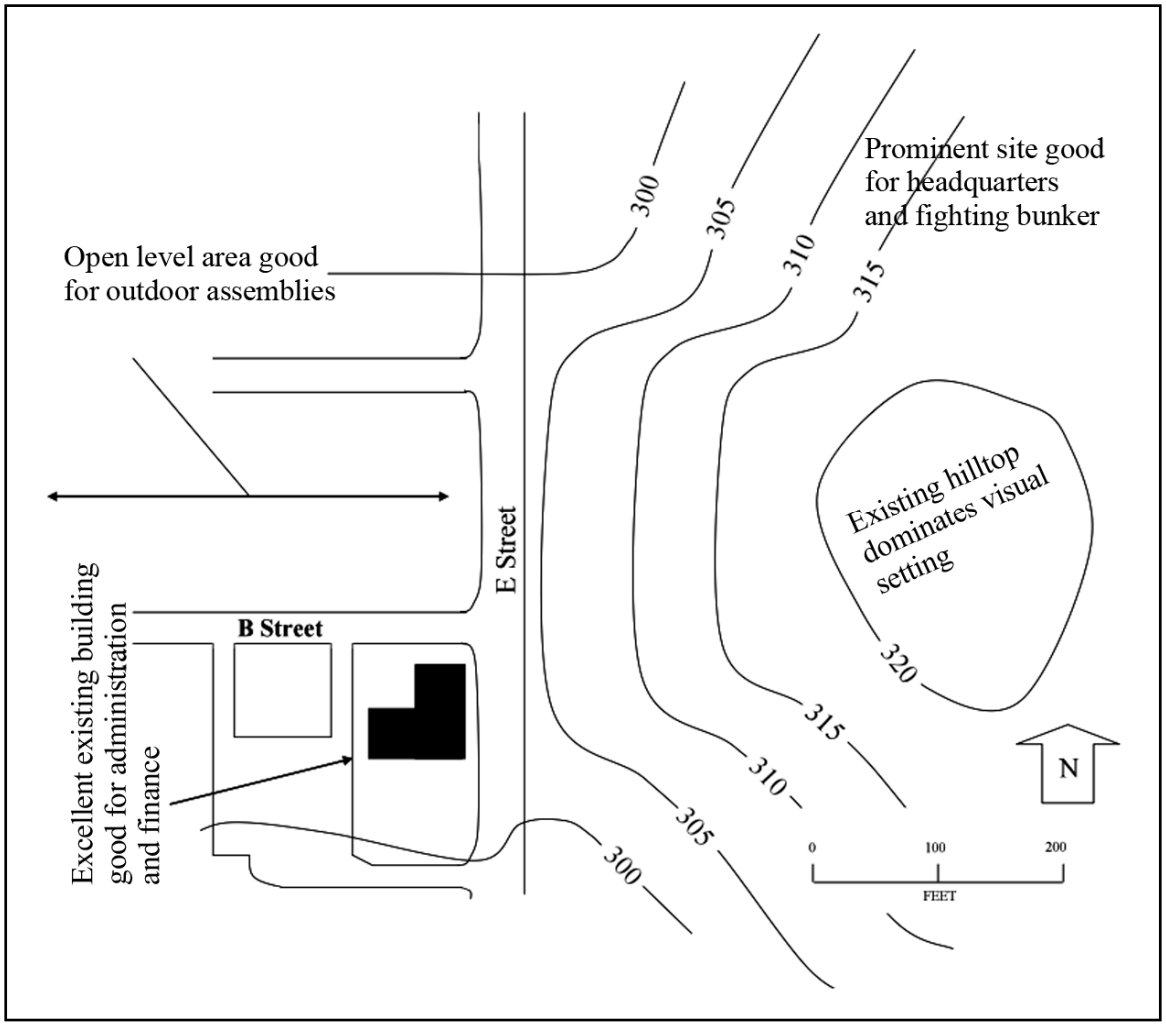

Figure E-10. Example major activities and structures analysis

E-9. Selected Land Use Policies. Land use policies are an inherent part of a viable land use plan. Table E-4 shows examples of policies that should be part of the land use plan.

Table E-4. Example of selected land use policies

Policy Type	Description
Expansion Policy	Reserve an area for construction of additional unaccompanied enlisted housing "above and beyond" current projected military strength levels. Action 1: Dispose of HN storage sheds in Area "Z" to free up land for one additional battalion-sized complex and— Action 2: Remove tents and containers in Area "L" to free up land for one more additional battalion-sized complex.
Displaced Persons Expansion Policy	Provide an expansion zone area for contingency development of a displaced persons camp in the event of instability in _____. Action: Provide 20% expansion factors in the utility lines planned to serve development in Area "A." The displaced persons camp would be buffered from the U.S. portion of the installation, but utilities would extend from Area "A."
AT/FP Policy	All land use zones and subdivisions thereof will provide for a setback distance of at least 45 meters between the building lines of primary gathering places and the edge of major streets and roads. Land area will be provided for construction of protective berms, fences, and other barriers. Standoff buffers will be provided between and around all land use zones.
NOTE: Land use goals and objectives developed during the identification phase will be the basis for developing more specific measures for implementing them. Each base camp will have to develop its own set of policies and actions to implement these policies. These can be very specific.	

APPENDIX F

Sample Documents to Support Facility Requirements Determination

F-1. The Facilities Requirements Planning Team Checklist. Like many of the other checklists provided in this pamphlet, the facilities requirements planning team checklist (shown in Table F-1) is provided to assist teams with the identification of major tasks that may need to be accomplished to accurately determine facility requirements.

Table F-1. Example of a facilities requirements planning team checklist

Check	Task	By (Initial)
	Initiate and maintain a working relationship with the prospective base camp user(s).	
	Initiate and maintain working relationship with the host nation, through the U.S. DOS representative, if appropriate.	
	Explain the list of facilities allowances to the prospective base camp user (and HN representatives if appropriate). (See Chapter 3.)	
	Conduct a detailed inventory of (any) existing facilities along with the prospective base camp user.	
	Analyze the existing facilities and infrastructure for shortfalls and excesses along with the prospective base camp user.	
	Determine the base camp user's special needs and facilities that are allowed but which the user states are not needed.	
	Develop and analyze alternatives to meet facilities requirements.	
	Schedule, rehearse, and conduct a decision briefing to explain and request the appropriate commander's approval of the most favorable alternative to meet facilities requirements.	
	Request and obtain written approval of the facilities requirements, and place this in the BCDP record.	
	Make a record of the facilities requirements development process, placing the quantitative and qualitative data in the TAB and the base camp development record.	
	Submit the TAB for higher command approval, as appropriate.	

F-2. The Mechanics of the Process. The process of moving from facilities allowances to facilities requirements is shown in Figure F-1. It is important for the planner to coordinate the allowances and requirements with the customer and the HN throughout the process.

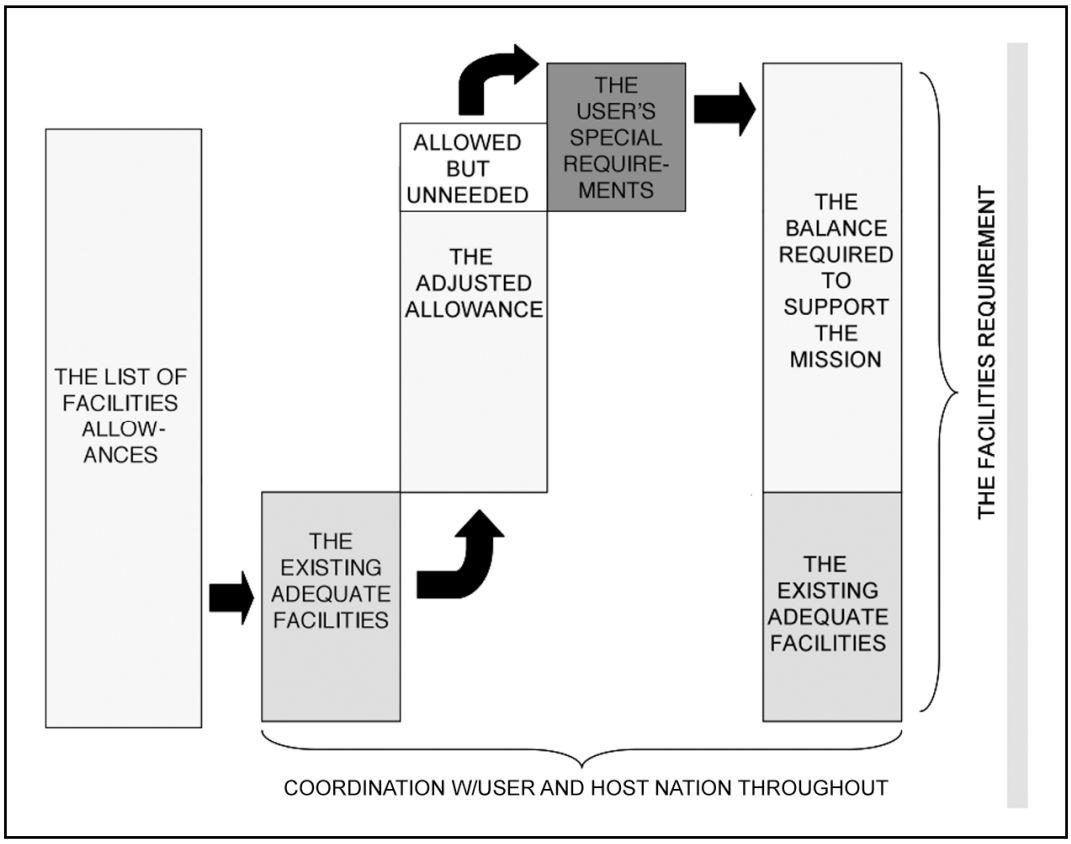

Figure F-1. The mechanics of the process—from facilities allowances to facilities requirements

F-3. Asset Inventory. Before determining facilities requirements, it is important to inventory available assets. Table F-2 describes some of the major items and the associated information needed for an appropriate inventory.

Table F-2. Examples of inventory data

Attribute	Measure or Qualification
Land	Area(s), names and dimensions
	Description of terrain, vegetation, and such
	Present use or use before U.S. presence
	Use(s) by U.S. forces
	Planned use after U.S. redeployment
	Operational and AT/FP considerations
	Environmental aspects/vulnerabilities
	Projected date of U.S. return to owner(s)
Buildings	Building number or letter designation
	Gross area
	Capacity, if applicable
	Designed use
	Year built
	Type of construction
	Conformance with AT/FP standards
	Condition of each building system
	Installed equipment
	Utility support (to each building)
	Projected date, method of disposal or turnover
Infrastructure	Name, number, or letter designation
	Length, area, and such
	Type of construction
	Capacity or capability
	Projected date, method of disposal or turnover
Utility systems	Each component name, number, or letter
	Length, area, and such
	Type(s) of construction/material used
	Capacity or capability, each component or subsystem
	Operational and AT/FP considerations and vulnerabilities
	Projected date, method of disposal or turnover

F-4. Primary Factors Influencing Requirements. There are many factors that influence actual requirements. The primary factors and process, shown in Figure F-2, require coordination and flexibility from the planner due to changes in the situation or the acquisition of new information.

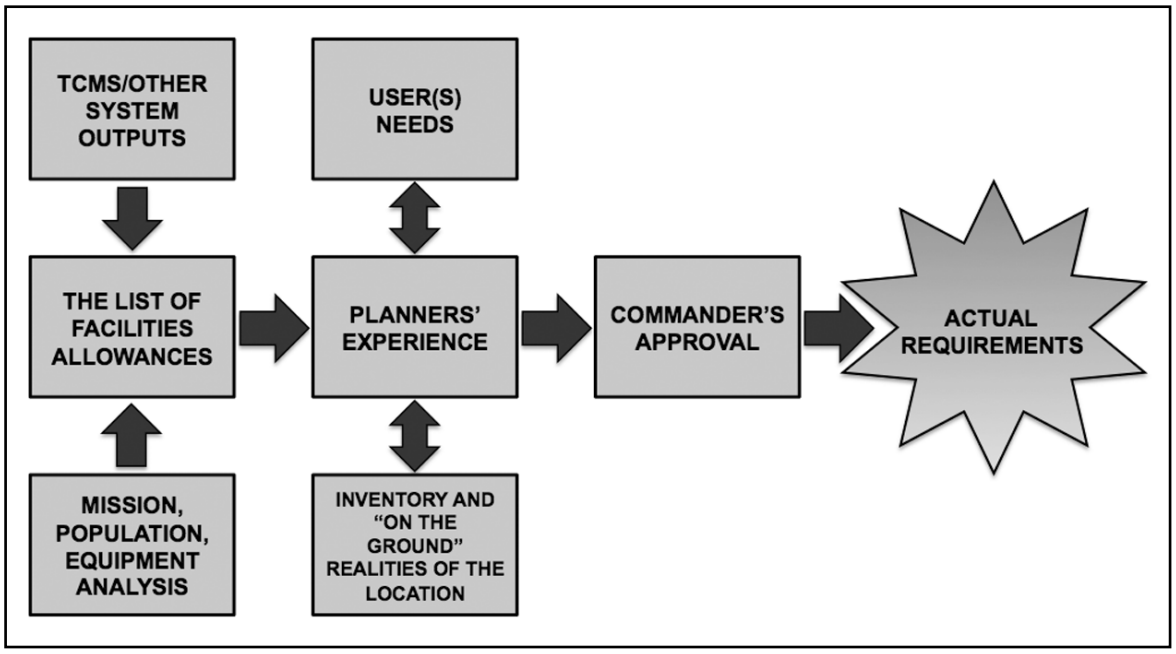

Figure F-2. The requirements determination process

F-5. Operational Requirements. Table F-3 provides an example of some of the operational requirements that could impact the functional requirements. In coordination with the customer, the planner should identify operational requirements as early in the BCDP process as possible.

Table F-3. Operational requirements that produce functional requirements

Operational Requirements	Functional Requirements
There is a threat from enemy aircraft or ballistic missiles.	Facility designs will either include, or require quick access to, overhead cover and lateral protection from indirect fire and standoff weapons. Dispersed site locations are required.
The estimated terrorist threat is very high.	Inhabited facilities must be set back from streets and roadways in accordance with current protection design standards. Berms, barriers, fences, lighting, guard posts are required.

Table F-3. Operational requirements that produce functional requirements

Operational Requirements	Functional Requirements
Assigned armor units need ammunition storage capacity for two basic loads.	The ammunition storage quantity/density will be increased to account for armor unit requirement. Increased quantity/safety distance is required.
New facilities construction will be accomplished by contract method.	Contractor housing, administrative, plant, storage, disposal areas, and haul routes are required.
Operating artillery and air defense systems will be located within the base camp land area but separate from built-up areas.	Add requirements for fire support bases to appropriate facility categories, such as remote housing, service member support, hardened ammunition holding, and AT/FP structures. Add this ammunition requirement to the required ASP capacity.
Rotary wing aircraft operations require "hot" refueling and rapid reloading of weapons systems.	AHA and fuel storage/pumping are required at airfield—close but cannot violate safety criteria.
Some assigned units have male and female service members.	Typically requires separate living, latrine, and shower facilities for each gender.
Air assault rapid reaction mission requires that an infantry company be deployed by rotary wing aircraft within 30 minutes, followed by a larger force.	The airfield should be within reasonable distance of troop housing via multiple access routes. A marshaling area; a command, control, and communication building; and a briefing building are required at the airfield.
Units will carry enhanced prescribed load list, spare parts, and components.	Parts storage areas in maintenance facilities should be increased.
Operations require rapid reaction combined arms battalion force.	Tracked-vehicle hardstand designs need multiple exits to area of operations that are ideally separated from wheeled-vehicle traffic.
BCT and battalion commanders C2 some operations from rotary wing aircraft.	Sufficient helipads should be located close to HQs and C2 facilities.
Base camp security will include mounted patrols around the base camp perimeter.	A paved perimeter road will enhance efficiency of patrols. Add this to requirement for paved roadways.
Because of its location on the MSR, transportation units will use the base camp as convoy offloading and/or stopover point.	Semitrailer truck aprons are required at warehousing facilities. Secure hardstand and driver/crew housing is required for overnight stopover of convoy trucks and security vehicles.

Table F-3. Operational requirements that produce functional requirements

Operational Requirements	Functional Requirements
Because of the duration of the mission, sustainment training of assigned units is a requirement.	Consult RTLP MCX. Add required ranges and training facilities to facility requirements. Include simulators.
Service members will not have privately owned vehicles or access to buses or taxis.	Provide service member support facilities within 1/4 mile (0.65 km) walking distance of unaccompanied personnel housing areas.
Base camp maintenance and repair will be performed by contractor forces.	Contractor housing, administrative, storage, and shop areas are required. (It may be possible to use the area initially occupied by the construction contractor.)

F-6. TAB Format. The TAB is the planner's detailed record of the facilities requirements development process. Table F-4 provides an example format for adequately documenting the necessary data.

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION I: MISSION STATEMENT					
Mission Statement:					
SECTION II: POPULATION DATA					
Category	**Number of persons (required strength):**				
	Unit A	Unit B	Unit C, and such	NAF, Contract, and such	Total
LOWER GRADE AND EQUIVALENT PERSONNEL					
Enlisted Personnel, grades E-1 to E-5					
U.S. Civilians GS-5 and below					
NAF Employees, grades 1 and 2					
U.S. Civilians WG-1 to WG-11 or WL-1 to WL-5					
Contracted Laborers					
COMPANY GRADE AND EQUIVALENT PERSONNEL					
Midgrade Enlisted, E-6 to E-7					
Warrant Officer, WO-1 and WO-2					
Officer, O-1 and O-2					
U.S. Civilians GS-6 to GS-9					
NAF Employees, NF3					
U.S. Civilians, WS-1 to WS-7					
U.S. Educators Schedule C1 to C3					
SENIOR COMPANY AND FIELD GRADE AND EQUIVALENT PERSONNEL					
Senior Enlisted, E-8					
Chief Warrant Officer, CW-3 and CW-4					
Officers, O-3 and O-4					
NAF Employees NF4					
Educators Schedule C4 and up, D-F, M-O and Teaching Principals – schedule L					
SENIOR GRADE PERSONNEL					
Senior Enlisted, E-9					
Chief Warrant Officers, CW-5					
Officers, O-5 and O-6					
U.S. Civilians, GS-13 to GS-15					
NAF Employees, NF5					

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

EXECUTIVE GRADE PERSONNEL					
Officer, O7					
U.S. Civilian Senior Executive Service					
NAF Employee, NF6					

SECTION III: ORGANIZATIONAL ELEMENTS DATA	
Organizational Element	**Quantity**
Brigade combat teams/brigades	Each
Battalions or squadrons	Each
Companies, batteries, and troops within the battalions	Each
Separate companies, batteries, and troops	Each
Separate detachments, and teams	Each
Base operations directorates and offices	Each
U.S. contracting firms	Each
Local national contracting firms	Each
Other organizations, and agencies	Each
TOTAL	

SECTION IV: PLAN-SHAPING EQUIPMENT DATA (*Examples Only*):					
	Unit A	Unit B	Unit C	NAF, Contract, and such	Total
C-17 Cargo Aircraft, U.S. Air Force (USAF)	418Th Tactical Airlift Squadron Air Liaison Officer (ALO) Guidance				2/Week
C-130 Cargo Aircraft (USAF)	418Th Tactical Airlift Squadron ALO Guidance				2/Day
AH-60 Apache Helicopter					
UH-60 Blackhawk Helicopter					
M-1A1 Abrams Main Battle Tank					
M-2 Bradley Infantry Fighting Vehicle					
M-109 Paladin 155mm Medium Self-Propelled Howitzer					
Multiple Launch Rocket System					
Commercial Tractors and Semitrailers, Fuel Tankers					

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
ROADS							
Primary	Mi SY						
Secondary	Mi SY						
Tertiary	Mi SY						
Tracked Vehicle	Mi SY						
DINING FACILITIES	SF PN						
HOUSING							
Lower Grade and Equivalent	SF PN						
Company Grade and Equivalent	SF PN						
Senior Company and Field Grade and Equivalent	SF PN						
Senior Grade	SF PN						
Very Important Persons (VIPs)	SF						
VIP, Task Force Allowance	SF						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
TOILETS AND SHOWERS							
Male	SF Fixtures						
Female	SF Fixtures						
HEADQUARTERS FACILITIES							
Task Force Headquarters	SF						
Brigade Headquarters	SF						
Battalion Headquarters	SF						
Company Admin and Supply	SF						
SUPPLY FACILITIES							
Supply Support Activity Warehouse	SF CF						
Supply Warehouse, Brigade Allowance	SF						
Direct Exchange/ Central Issue Facility	SF						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
FINANCE AND PERSONNEL SUPPORT	SF PN						
POSTAL FACILITY	SF						
LAUNDRY COLLECTION/ DISTRIBUTION POINT	SF						
AVIATION							
Fixed Wing Runway and Taxiway	SY Length/ Largest Aircraft						
Fixed Wing Apron	SY # Aircraft						
Helicopter Parking Pad	SY # Aircraft						
Vehicle Parking, Aircraft Servicing	SY #Aircraft						
Helicopter Landing Pad	SY EA						
Aircraft Fuel Storage and Refuel Point	EA GAL Outlets						
Control Tower	EA Class/Ht.						
Airfield/Squadron Operations	SF						
Aviation Ground Vehicle Maintenance Shop	SF Bays						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Helicopter and Aircraft Wash Racks	SY # Aircraft						
Hot Refueling Point	EA GAL						
Hot Rearm Point	EA # Aircraft						
COMMUNICA-TIONS COMPOUND/ NETWORK SERVICE CENTER							
Small	SF						
Medium Small Facility	SF						
Medium Facility	SF						
Large Facility	SF						
MEDICAL AND DENTAL FACILITIES							
Battalion Aid Station	SF Beds						
Medical Clinic	SF Treatment Areas						
Dental Clinic	SF Treatment Units						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Holding Clinic	SF Beds						
Field Hospital	SF Beds						
Mobile Surgical Unit	SF Operating Rooms						
MOTOR POOLS							
Maintenance Shop, Battalion	SF Bays						
Maintenance Shop, Separate Company	SF Bays						
Maintenance Administration	SF						
Maintenance Pad	SY Type						
Vehicle Storage Hardstand	SY # Vehicles						
Oil and Lubricant Storage	SF						
Wash Rack	EA # Vehicles						
FUEL STORAGE							
Fuel Storage	EA GAL						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Fuel Dispensing	EA Outlets						
HAZARDOUS MATERIALS FACILITIES							
Hazardous Waste Collection Point	EA Class						
Hazardous Materials Warehouse	SF Class						
PARKING LOTS							
Military Vehicle Parking, Wheeled ¾-Ton and Smaller	SY #Vehicles						
Military Vehicle Parking, Wheeled, 2 1/2-Ton and Larger	SY # Vehicles						
Commercial and Civilian Vehicle Parking	SY # Vehicles						
Military Vehicle Parking, Tracked	SY # Vehicles						
DIRECT SUPPORT MAINTENANCE							
Direct Support Maintenance Shop	SF Bays						
Direct Support Material Storage	SF						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Direct Support Vehicle Holding Area	SY # Vehicles						
Direct Support Paint, Oil & Lubricant Storage	SF						
KENNELS	SF # Animals						
MORGUE	SF # Casualties						
DEFENSE REUTILIZATION AND MARKETING							
Defense Reutilization and Marketing Office	SF						
Defense Reutilization and Marketing Salvage Yard	Acres						
Defense Reutilization and Marketing Covered Storage	SF						
AMMUNITION SUPPLY							
Ammunition Storage Bunker	SF Type and Capacity						
Ammunition Handling Area	SY Type and Capacity						
Basic Load Ammunition Holding Area	Acres, Type, and Capacity						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Captured Ammunition Holding Area	Acres, Type, and Capacity						
Munitions Disposal Area	Acres Capacity						
FIRE PROTECTION							
Fire Station	SF Bays						
Airfield Fire and Rescue Station	SF Bays						
Aircraft Deluge Fire Suppression	EA GAL						
TRAINING							
Deployed Training Support Center	SF # Students						
Deployed Distance Learning Center	SF # Students						
Training and Audiovisual Support Center	SF						
Small Arms Virtual Trainers	EA # Students						
Indirect Fire Trainer	EA # Students						
27-Meter Range	EA # Points						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Deployable Firing Range and Targetry System	EA TYPE						
Assorted Nonfiring Training Courses/ Outdoor Classrooms	EA #students						
Maneuver Training Area	Acres Unit-Types, # Units						
MILITARY POLICE STATION	SF						
AREA SUPPORT GROUP/TEAM							
Directorate of Logistics Facilities	SF Acres						
Directorate of Public Works Facilities	SF Acres						
Directorate of Contracting Facilities	SF						
Directorate of Information Management Facilities	SF						
Directorate of Personnel and Community Activities Facilities							
Security Officer Facilities							
Safety Office Facilities	SF						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
FORCE PROTECTION							
Bunkers/Living-Fighting Bunkers	EA PN						
Guard Towers	EA Type						
Constructed Fighting Positions	EA Type						
Base Camp Entry Control Points	EA Type						
Fencing and Barricades	LF/EA Mi						
SERVICE MEMBER AND AUTHORIZED PERSONNEL SUPPORT							
Chapel	SF Seats						
Education Center, Defense Logistics Agency	SF # Students						
Education Center, Military Occupation Specialty (MOS)	SF # Students						
ARMY AND AIR FORCE EXCHANGE SERVICE (AAFES)							

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Barber/Beauty/ Alteration/Pressing Facility	SF						
Post Exchange (PX)	SF						
PX Warehouse	SF						
Food Service/ Concession Stands	SF EA						
MORALE, WELFARE, AND RECREATION (MWR)							
Fitness Facility	SF						
Field House, Multipurpose Facility	SF # Seats						
Community Center	SF						
Theater, Multipurpose Use	SF # Seats						
MWR Warehouse	SF						
Multipurpose Court	EA						
Multipurpose Athletic Field	EA						
Fitness Course	EA						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
AMERICAN FORCES NETWORK FACILITY	SF						
CONTRACTOR FACILITIES							
Contractor Administration Building	SF						
Contractor Plant	EA Output Capacity						
Contractor Equipment Storage Area	SY # Equipment						
Contractor Covered Storage Area	SF Type Material						
Contractor Vehicle Parking Area	SY # Vehicles						
UTILITIES							
Water Plant	EA GAL						
Water Wells	EA GAL						
Wastewater Treatment Plant	EA GAL						
Electric Power Generation Facility	EA KW						

Table F-4. Example format for a tabulation of existing and required facilities (TAB)

SECTION V: FACILITIES REQUIREMENTS DATA							
Key to Units of Measure/Capacity: SF – Square Feet; SY – Square Yards; Mi – Statute Miles; CF – Cubic Feet; PN – Persons; EA – Each; Ht – Height; GAL – Gallons; KVA – Kilovolt Amps; KW – Kilowatts							
Fac. Type/ Name (*Examples Only*)	Primary & Secondary Unit of Measure or Capacity	Total Allowed	Total Required	Existing Adeq.	Existing May Be Made Adeq.	Existing Inadeq. Mothball (M) or Demolish (D)	Remarks
Electric Substation	EA KVA						
Heating, Ventilation, and Air Conditioning	EA Type						
Water Lines	LF Size						
Sewer Lines	LF Size						
Electric Lines	LF KVA						
Gas Lines	LF Size, Pressure						

APPENDIX G

Sample Documents to Support General Site Planning

G-1. The Base Camp Development Site Plan Checklist. The BDSP checklist is a resource designed to provide planners a comprehensive list of the attributes that should be considered throughout the BCDP process. Since the BDSP requires products from the various steps of the process, many of the listed attributes will have been accomplished before the actual development of the plan. This checklist, shown in Table G-1, pages G-1 through G-3, should be reviewed and will serve as a reminder for planners of all the coordination and actions required to develop a successful base camp plan.

Table G-1. Example of a base camp development site plan checklist

Attribute	Description	Initial
1. Team Effort	The BDSP was prepared by a multidisciplinary planning team.	
2. User Coordination	The prospective base camp user was represented on the planning team.	
3. HN Coordination	The HN was represented on the planning team (if applicable).	
4. Source Documents	The environmental overlay, the TAB, and the land use plan were among the source documents used to prepare the BDSP.	
5. Comprehensive-ness	The BDSP fully conforms to the land use plan. All new area, facility, and infrastructure requirements identified by the TAB have been sited on the BDSP.	
6. Site Visits	The planning team has visited and inspected all site locations proposed by the BDSP and have determined them to be constructible.	
7. Technical Reviews	Technical reviews for special facilities, such as aeronautical, munitions storage and handling, ranges and training, high security, communications, medical, and religious, have been sought in advance and accomplished.	
8. Alternatives	The finalized BDSP is based upon the development and comparative analysis of alternative approaches.	
9. Health, Safety, and Security	The base camp layout protects and provides for the health, safety, and security of its occupants. In this regard, the BDSP complies with the criteria established by Unified Facilities Criteria (UFC) 4-010-01 and applicable Army and theater standards.	

Table G-1. Example of a base camp development site plan checklist

Attribute	Description	Initial
10. Functional Efficiency	The base camp general site layout facilitates operational efficiency, particularly regarding time-distance relationships between various functions. The BDSP is functional in terms of supporting the mission while providing the maximum possible quality of life to the base camp occupants.	
11. Flexibility	The BDSP ensures the ability of the existing development pattern to adapt to change. It has the capacity to adequately support the existing and projected missions, as well as unforeseen expansions. The plan designates certain buildable areas as expansion zones.	
12. Use of Existing Facilities	The plan maximizes the use of existing adequate HN facilities, thereby reducing construction requirements, development costs, and the time it takes to become fully operational. At the same time, the proposed changes to these facilities take into account the eventual closure of the base camp and the return of these facilities to HN control.	
13. Sustainability and Conservation	The conservation of renewable resources is evidenced in the BDSP. The development minimizes irreversible changes to the form and condition of the land upon which the base camp is located. Energy conservation results from the efficient arrangement of facilities.	
14. Environmental	The base camp layout protects and enhances the environment. The general site layout of the base camp is based upon the environmental overlay, avoiding environmentally sensitive zones. Wherever possible, environmental enhancements are planned.	
15. Maintainability	The arrangement and composition of facilities on the BDSP will ensure that maintaining them is as efficient as possible.	
16. Harmony and Aesthetics	The BDSP provides for harmony between natural and man-made features, taking advantage of positive features to enhance mission performance and quality of life. The layout of the base camp respects the landscape (terrain, vegetation, waterways, geology, soils, and such). The plan demonstrates respect for and harmony between natural and man-made forms, forces, and features.	

Table G-1. Example of a base camp development site plan checklist

Attribute	Description	Initial
17. Surrounding Community	The plan provides for compatibility between the base camp and its surrounding community, if applicable. Military operations are kept an acceptable distance away from HN residential areas. The plan takes HN religious, cultural, and socioeconomic characteristics into account.	
18. Circulation	The BDSP achieves road network accessibility and traffic circulation. The BDSP provides access to the MSR, and it makes sure that the facilities within the base camp are convenient to one another and to the users.	
19. Climate and Seismic	The BDSP takes the climate into consideration with respect to building locations and orientation. The plan is sound with respect to the climatic zone, and makes allowances for the seismic zone and the potential for hazardous weather.	
20. Utility Plans	The utility overlays provide for constructible, maintainable, efficient, expansible, and cost-effective utility support with adequate capacity to support the planning strength plus surge capacity.	
21. Other Plans	Other plans that are based on the BDSP and are required by the theater command have been prepared.	
22. Area Development Plans	Enlarged, more detailed plans have been prepared for areas of intense development; for example, community centers and service member support areas, if applicable.	
23. Base Camp Cleanup and Closure	The facility layout proposed by the BDSP has taken base camp cleanup and closure into account.	
24. Action Plan	The plan is based on a feasible and cost-effective concept. The layout is both constructible and cost-effective. In applicable cases, it is compatible with HN requirements and preferences.	
25. Approvals	The final review and approval process for the BCDP, including the BDSP, is understood and has been/is being followed. BDSP revalidation requirements are understood.	
26. Ownership	The base camp commander and the commander of the using unit(s) have a sense of ownership of the BDSP and the entire base camp development plan.	

G-2. Facility Footprint. The footprints shown in Figure G-1 show some of the typical facilities that should appear on the BDSP. The facilities should represent the size and shape of a typical facility of the type that is being proposed for the plan.

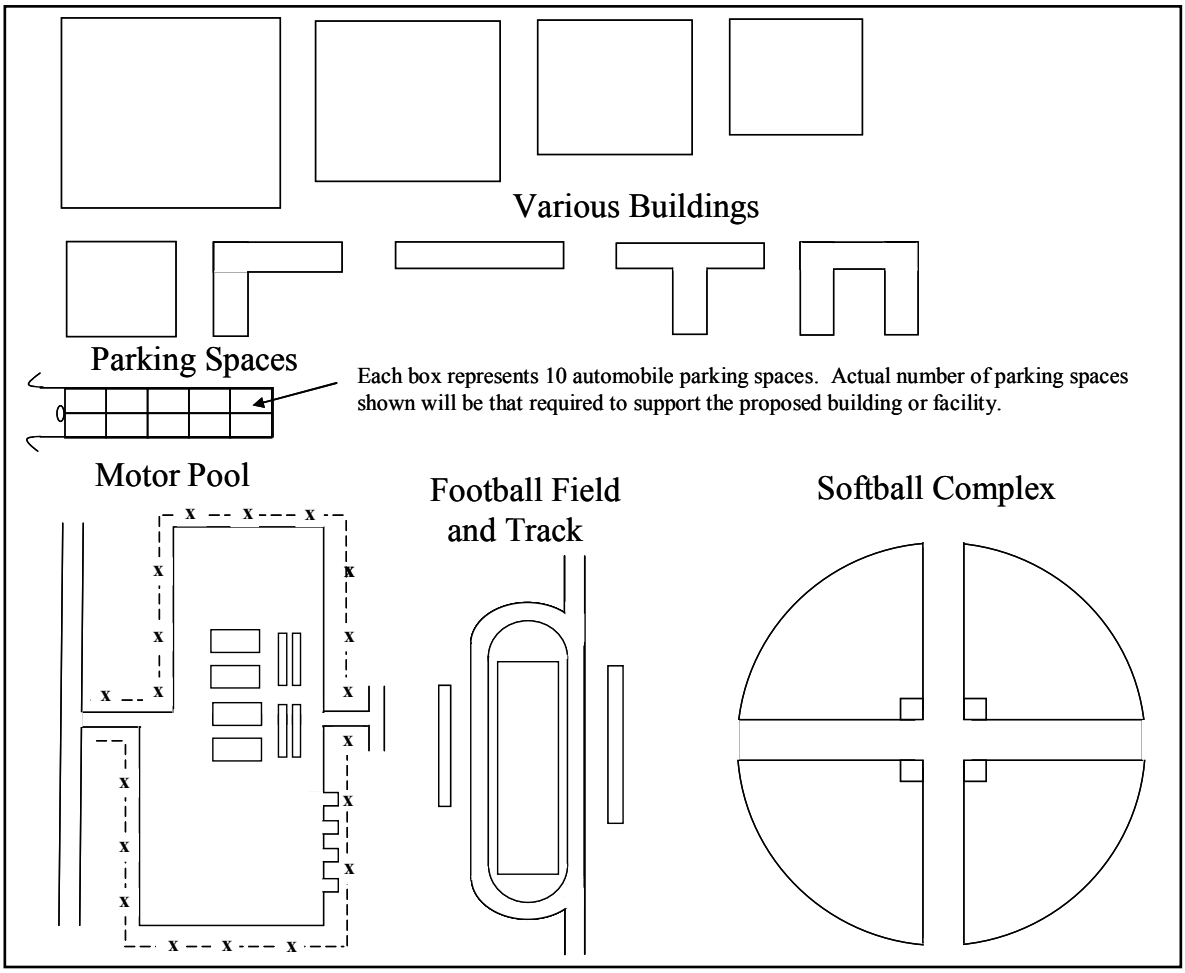

Figure G-1. Typical facility "footprints" drawn at various scales

G-3. Footprint of a SEAHUT Housing Cluster. Figure G-2 depicts a typical SEAHUT cluster. The number of required clusters is derived from the TAB.

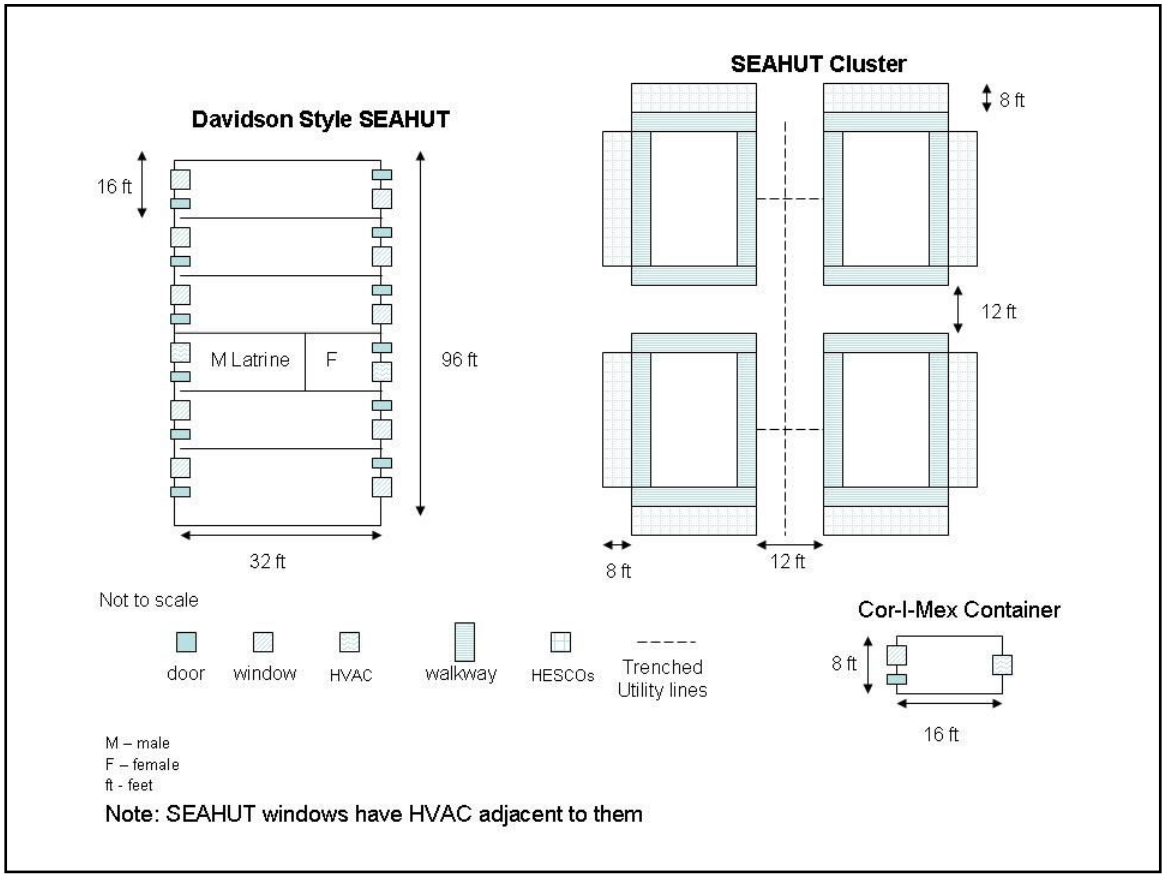

Figure G-2. Footprint, Southeast Asia hut (SEAHUT) housing cluster derived from the TAB

G-4. Standoff Distances and Building Separation. Standoff and building separation are necessary for force protection and required by regulation. Planners should verify distances to ensure that the most current minimum distances are incorporated and that they satisfy the user's situation requirements. Figures G-3 and G-4, pages G-6 and G-7, provide examples of minimum separation and standoff distances.

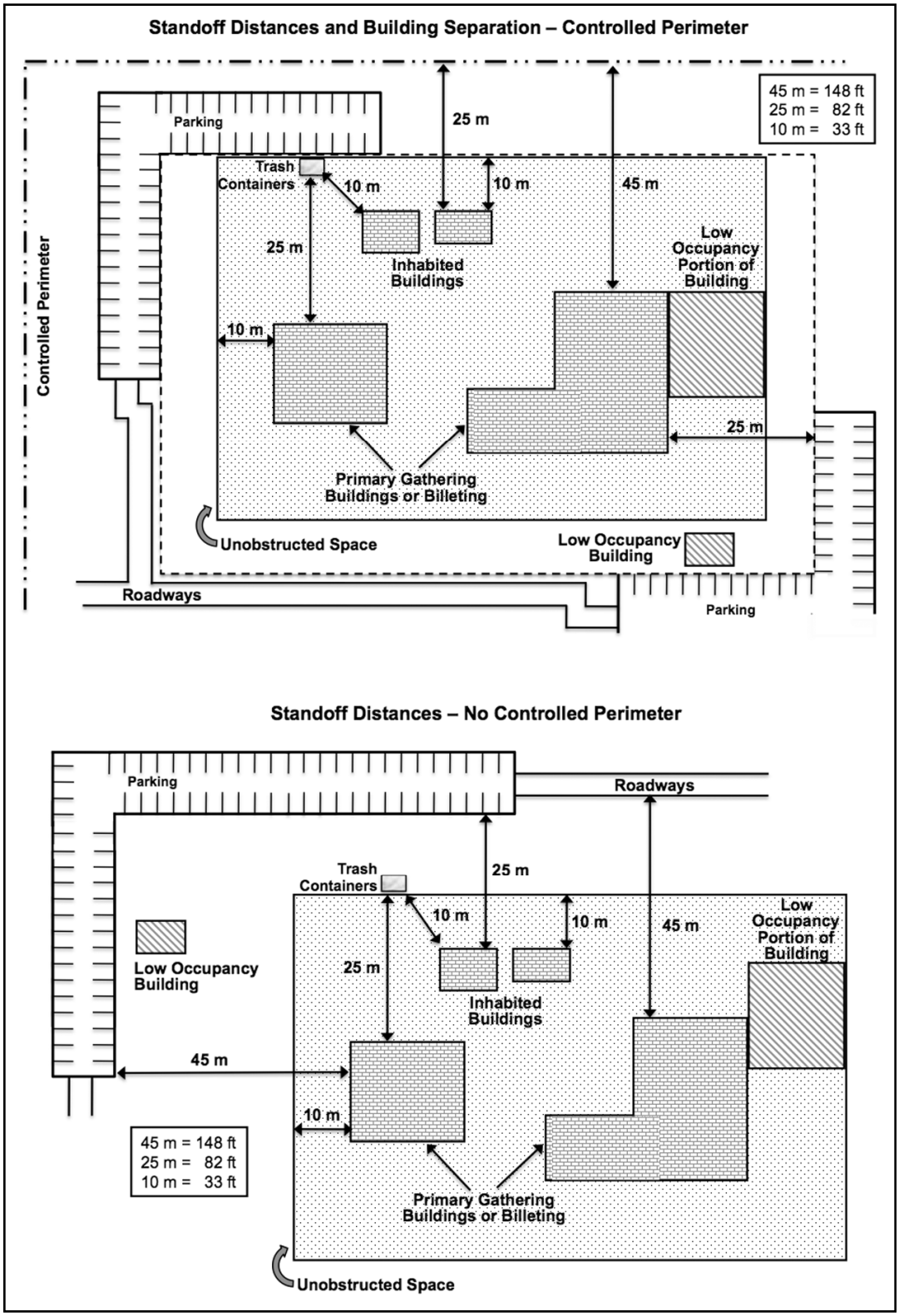

Figure G-3. Standoff distances and building separation–controlled and uncontrolled perimeter

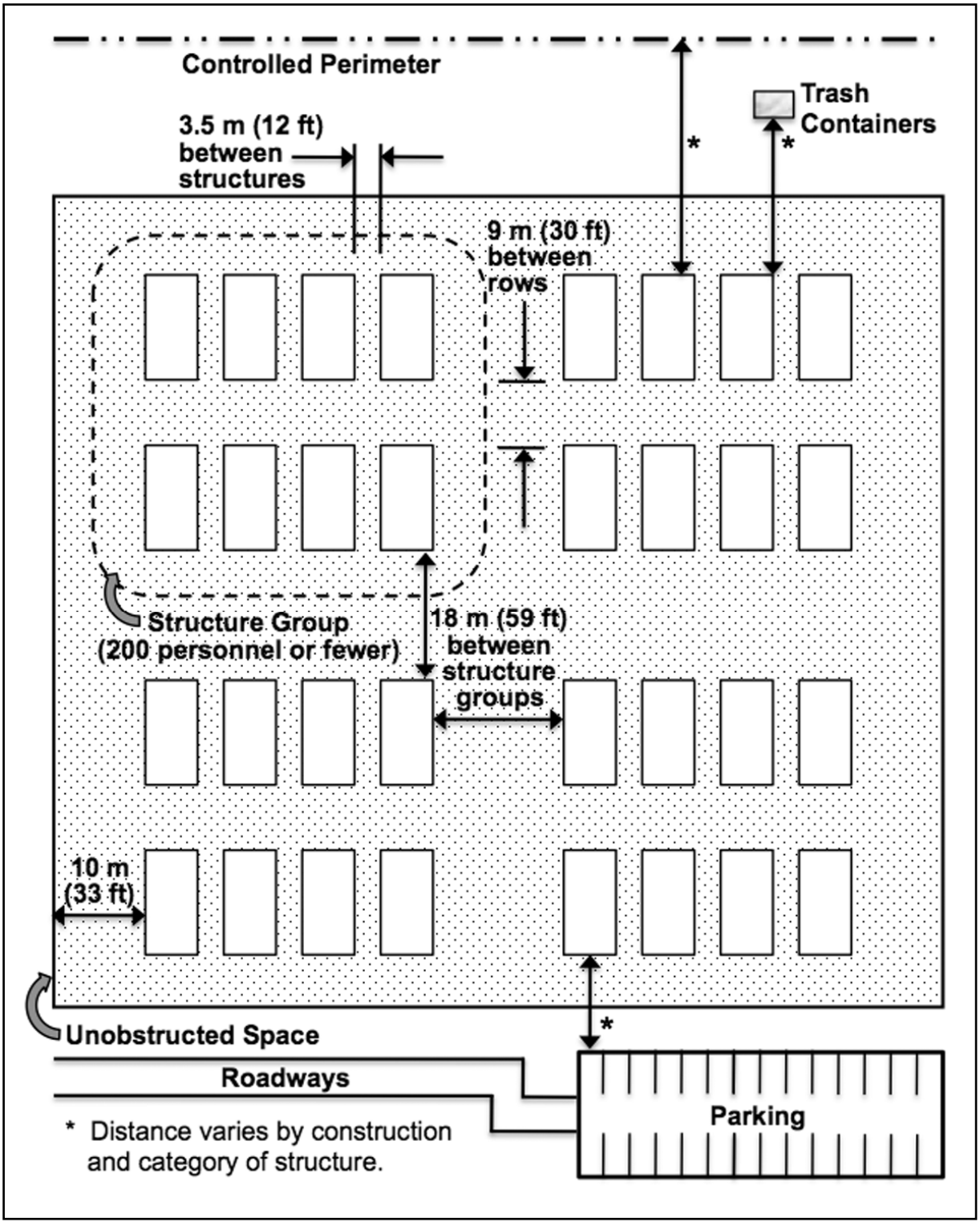

Figure G-4. Standoff distances and separation for expeditionary and temporary structures

G-5. Comparison Analysis. Figure G-5 depicts a comparative analysis of the anticipated population against selected systems. This tool can assist planners in very quickly identifying shortfalls with various infrastructure and/or utility systems. Planners should ensure that they consider the effects of surge and the potential for a change of mission when conducting this analysis.

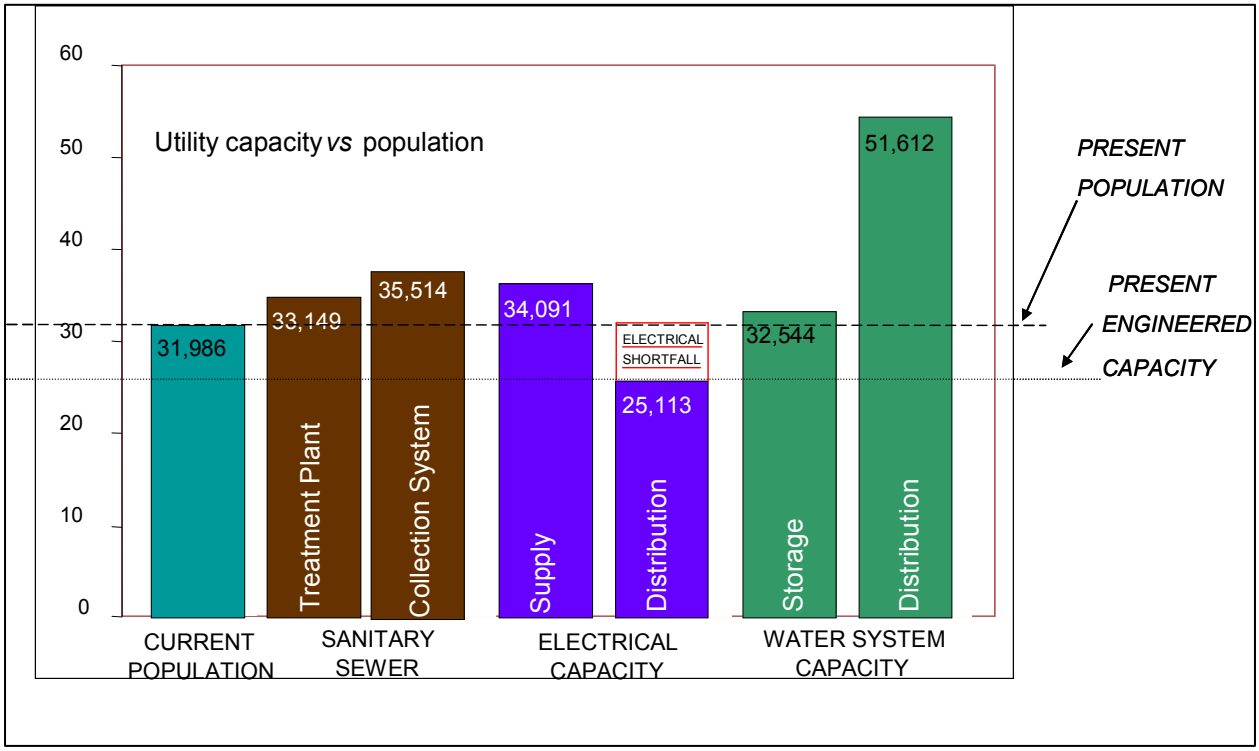

Figure G-5. Comparative analysis, existing utility systems

G-6. Base Camp Plan Phasing Tools. Figure G-6 and Table G-2 show examples of the tools necessary for incorporating phasing into the base camp plan. Together, the map and the prioritized project list will assist planners in tracking progress. If priorities change, the map should also be updated to incorporate those changes.

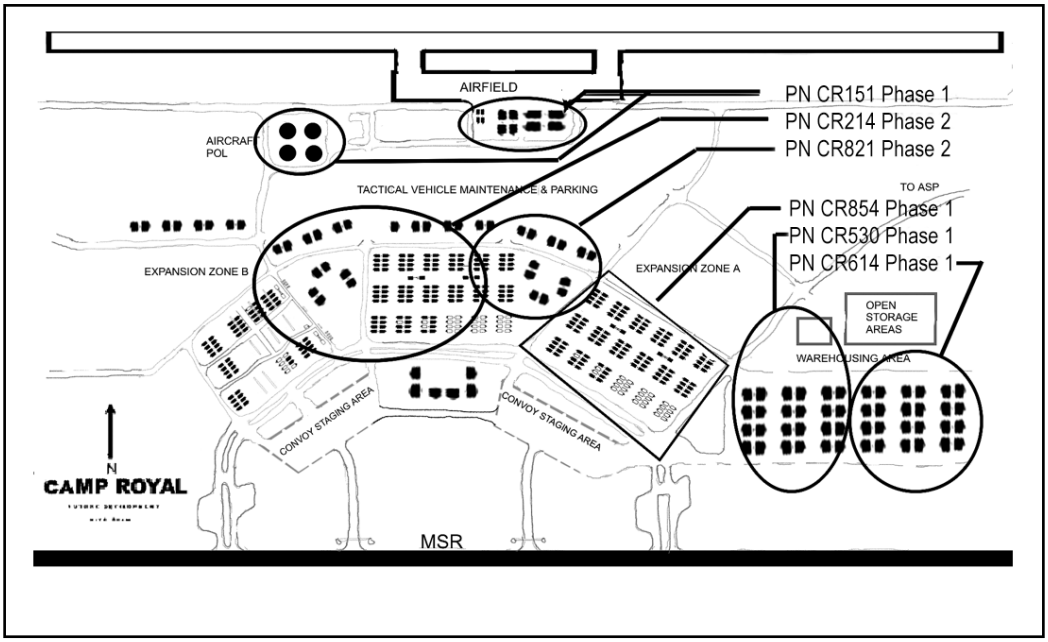

Figure G-6. A project phasing map

Table G-2. Example of a prioritized project list

Phase	Action or Project	Scope	Estimated Cost ($000)
01	PN FR 08-01 UPH Renovation Phase I	92,100/422 SP	2,500
	Self-help improvements	TBD	100
	Dispose of temporary buildings	150,000 SF	443
	Unit relocations for Renovation II	1 battalion	500
02	PN FR 09-01 UPH Renovation Phase II	105,250/422 SP	2,629
	Self-help improvements	TBD	100
	Unit relocations for Renovation III	1 HBCT (+)	2,000
	Dispose of temporary buildings	150,000 SF	450
03	PN FR 10-01 UPH Renovation Phase III	272,400/997SP	5,100
	Self-help improvements	TBD	100
	Dispose of temporary buildings	150,000 SF	475
	Unit relocations for Renovation IV	1 battalion	500

KEY

HBCT - heavy brigade combat team
SF - square feet
TBD - to be determined
UPH - unaccompanied personnel housing
PN FR - project number
SP- support personnel

Table G-3. Example of a project priority list with phasing sequence

Priority	Project Number	Project Description	Phasing Sequence
1	858	Vehicle Maintenance Shop	1
2	3118	Hazardous Materials Facility	
3	6424	Modified Record Fire & Combat Pistol Range	
4	13532	Vehicle Maintenance Shop	
5	16032	Upgrade M16 Record Fire Range 3	
6	16443	Religious Activity Facility	
7	17154	General Instruction Building	
8	18166	Vehicle Maintenance Facility	2
9	18600	Upgrade Primary Power	
10	19636	Physical Fitness Training Facility	
11	19699	Vehicle Maintenance Facility	
12	20807	Tracked Vehicle Maintenance Facility	
13	21660	Railhead Upgrades	3
14	22560	Physical Fitness Training Center	w/5
15	22993	Vehicle Maintenance Facility	3 (Cont'd.)
16	23301	Upgrade Night Fire Range	
17	23484	Hazardous Material Storage Facility	
18	27775	Vehicle Maintenance Facility	4
19	33967	Tactical Equipment Shop	
20	3626	Vehicle Maintenance Facility	
21	14104	Open Storage Area	
22	14112	Road Improvements and Truck Pad	
23	14529	Vehicle Maintenance Facility	5

G-7. Base Development Plan Record. Table G-4, pages G-11 and G-12, shows two examples of a base development plan record. Whatever format is used, the lead planner must ensure that it contains all the documents that were pertinent to the planning of the base camp. It is recommended that at least three paper copies and supporting digital copies be made of the record. Additionally, it is recommended that, as a minimum, one copy be submitted to the appropriate level of command, one copy be maintained at the base camp, and one copy be retained by the planning team leader.

Table G-4. Two possible formats for a base camp development plan record

Format 1		Format 2	
Section	**Title of Section**	**Section**	**Title of Section**
-	Title Page	-	Title Page
-	Commander's letter w/portrait	-	Commander's Letter
-	Table of contents	-	Table of contents
1	Introduction	1	Introduction
1.1	Purpose and need	1.1	Purpose and need
1.2	Base camp development plan	1.2	Background of planning process
2	Goals and Objectives	1.3	Base camp development plan
2.1	_____Theater command's strategic plan	2	Goals and Objectives
3	Plan Findings and Recommendations	2.1	Base camp vision and goals
3.1	Findings, recommendations, and urgent issues	2.2	Mission
4	Local and Vicinity Profile	2.3	Facilities
4.1	Setting and history	2.4	Objectives
5	Overview of Plan Documents	3	Findings and Recommendations
5.1	Land use plan	3.1	Methodology
5.2	Tabulation of existing and required facilities	3.2	Findings
	Glossary	4	Local and Vicinity Profile
	Acknowledgments and maintenance	4.1	Overview
		4.2	The adjacent community and region
		4.3	Base camp-community planning issues
Maps		4.4	Regional development issues
	Regional Development Issues	5	Plan Documents - Overview
	Environmental Overlay	5.1	Plan policies
	Expansion Capability	5.2	Planning board records
	Building Conditions	5.3	Plan policies and enforcement process
	Base Camp Development Site Plans (General Site Planning)	**Appendixes**	
Figures and Tables		A	Interview Notes
	Plan documents	B	Glossary

Table G-4. Two possible formats for a base camp development plan record

Format 1		Format 2	
	Goals of the planning process	C	Tabulation of Existing and Required Facilities
	Urgent issues and plan recommendations	D	Update Requirements and Information
	Population of Camp _____	Tables	(Various—Appear throughout the document)
	Impact on the local economy	Maps	(Various—Appear throughout document)
	Camp _____ utility capacity vs. population	Figures	(Various—Appear throughout document)
	Summary of essential facilities requirements	Photos	(Various—Appear throughout document)
	Essential facilities requirements analysis		
	Renovation and construction programs		
	Preparers, data sources, and update information		

APPENDIX H

Sample Documents to Support Base Camp Cleanup and Closure

H-1. Base Camp Closure Organization (BCCO). The base camp will often require a BCCO to organize cleanup and closure activities. This organization will be drawn from the base camp residents and will likely include representatives from the theater command. Figure H-1, page H-2, provides a sample BCCO.

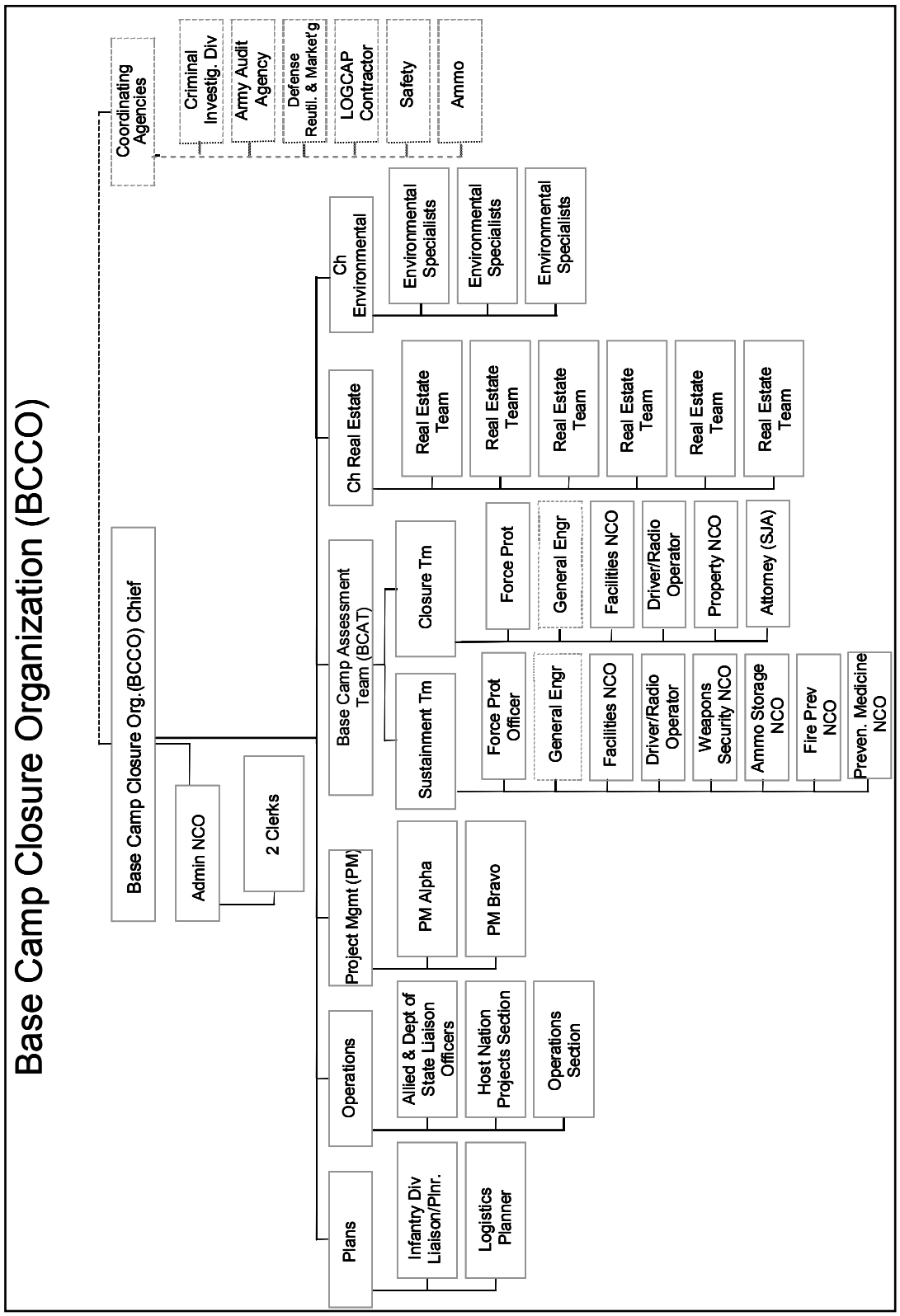

Figure H-1. Sample base camp closure organization

H-2. Base Camp Closure Activities. Base camp closure encompasses a variety of activities. While not all of the activities listed below will be required for each camp, this list is typical of many of the tasks accomplished by the BCCO that are required for an effective base camp cleanup and closure. Conducting coordination with and obtaining approvals from appropriate commands is vital to the success of the closure organization and subsequent camp closure. A typical array of interdependent command, staff, and operational activities and events that might be involved in a base camp closure operation include—

- Initiate preliminary planning.
- Conduct location selection.
- Plan land use.
- Coordinate BCCAT assessments.
- Conduct a risk assessment (preliminary hazard analysis).
- Submit the ammunition site plan to higher HQ.
- Identify communication and data line removal requirements.
- Establish lists of equipment and material disposition.
- Review real estate leases or other use agreements, resolved real estate claims, and condition survey reports.
- Cancel nonessential work orders.
- Prepare a list of hazardous substance spills and contamination.
- Identify AAFES and MWR requirements.
- Prepare a list of environmentally sensitive operations.
- Prepare closure plans for environmentally sensitive services.
- Identify staging areas requirements (areas where troops and equipment assemble awaiting transport).
- Review phased troop redeployment schedule.
- Prepare a list of equipment being loaned, leased, or provided by the United States to the HN or vice versa.
- Prepare a list of structures and infrastructure.
- Begin initial negotiations with HN utilities.
- Prepare an incineration plan.
- Prepare a preliminary closure plan.
- Make an initial BCCAT visit to the base camp.
- Begin closure and restoration dialogue with property owners or HN officials.
- Provide a preliminary notice to vendors and concessions.
- Establish a preliminary force protection planning cell.
- Pre-position military vans at staging areas.
- Prepare restoration estimates.
- Conduct an interim BCCAT visit to the base camp.
- Conduct an imminent health threat inspection.
- Prepare a disposition plan.
- Prepare a final base camp closure dismantling plan and obtain approval from the commander.
- Prepare a restoration (earthwork) plan.

- Conduct unit police (pick up and clean up) of areas for trash and hazardous substance spills.
- Conduct unit movement of organic equipment to staging area.
- Begin redeployment of units.
- Conduct unit movement of nonorganic property to staging area.
- Reduce utilities and contracted services.
- Accomplish initial consolidation (shrinkage) of the base camp.
- Prepare an ECR.
- Give final notice to vendors and concessions.
- Close down, demilitarize, and remove firing ranges; restore to established standard.
- Give notice of lease termination to property owner(s).
- Accomplish negotiations with utilities.
- Prepare the final force protection consolidation plan and obtain approval from the commander.
- Accomplish final lease negotiations.
- Close vendors and concessions.
- Redeploy AAFES.
- Redeploy all nonessential units.
- Send range removal certification to the appropriate command.
- Accomplish spill removal or cleanup.
- Conduct final consolidation (shrinkage) of the base camp.
- Install generators, if needed.
- Conduct a local radiation closeout survey.
- Redeploy the Class A agent (finance officer).
- Terminate utilities.
- Complete dismantling.
- Complete solid waste removal.
- Prepare the final risk inspection report.
- Certify that the dump site (if there was one) is closed.
- Complete HW removal.
- Complete restoration (earthwork).
- Redeploy contractor(s) and DOD civilians.
- Document spill removal/cleanup.
- Prepare an ECR and file it with the office of record at the command.
- Redeploy MWR personnel, equipment, and resources.
- Conduct an outgoing inspection by the United States and property owner(s).
- Ensure correction of deficiencies noted during the inspection.
- Conduct a final BCCAT visit to the base camp.
- Redeploy base camp operators and units involved in the closure.
- Consolidate environmental, real estate, and work order files.
- Proof and assemble base camp cleanup and closure archive.
- Ensure that base camp cleanup and closure archive becomes permanent files at the designated office of record.

- Ensure that the security manager reviews the archive and abridges a copy to eliminate classified/sensitive documents.
- Ensure that the base camp cleanup and closure archive, abridged by the security manager, is sent to the U.S. National Archives as public record; Headquarters, USACE Office of History; and to the HN government.

H-3. Camp Cleanup and Closure Execution. Base camp cleanup and closure, as with any detailed project, requires a means of planning and tracking progress. One tool, as shown in Figure H-2, is a work schedule developed using Microsoft Project. Other planning tools, both automated and manual, may also be used. A good visual means to articulate the base camp cleanup and closure plan is through the use of maps, as shown Figures H-3 and H-4, pages H-6 and H-7, that graphically depict how the plan will unfold.

ID	Task Name	Duration
1	Cleanup and Closure	47d
2	Remove MWR, dayroom, AAFES	3d
3	Remove first 56 modular billets	6d
4	Remove second 65 billets	7d
5	Recover first 6 ablutions	2d
6	Recover first sewage/water tanks	2d
7	Remove third 147 billets	15d
8	Remove final 55 billets	6d
9	Recover remaining 6 ablutions	3d
10	Recov'r remain'g sewage/H2O tanks	2d
11	Re-grade site drainage, re-seed	2d
12	Remove GP Meds, rake, re-seed	2d
13	Rem'v sidewalks/matting/hex plates	2d
14	Rem'v force prot structures, re-seed	2d
15	Remove concertina, mow, re-seed	2d
16	Remove berms, rake, re-seed	5d
17	Joint inspection, lease termination	1d
18	Prepare Archive, submit for appv'l	32d

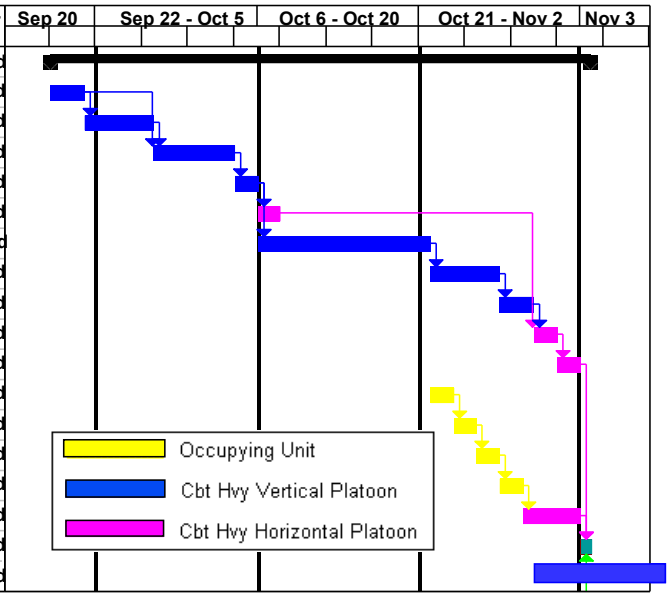

Figure H-2. Sample project work schedule

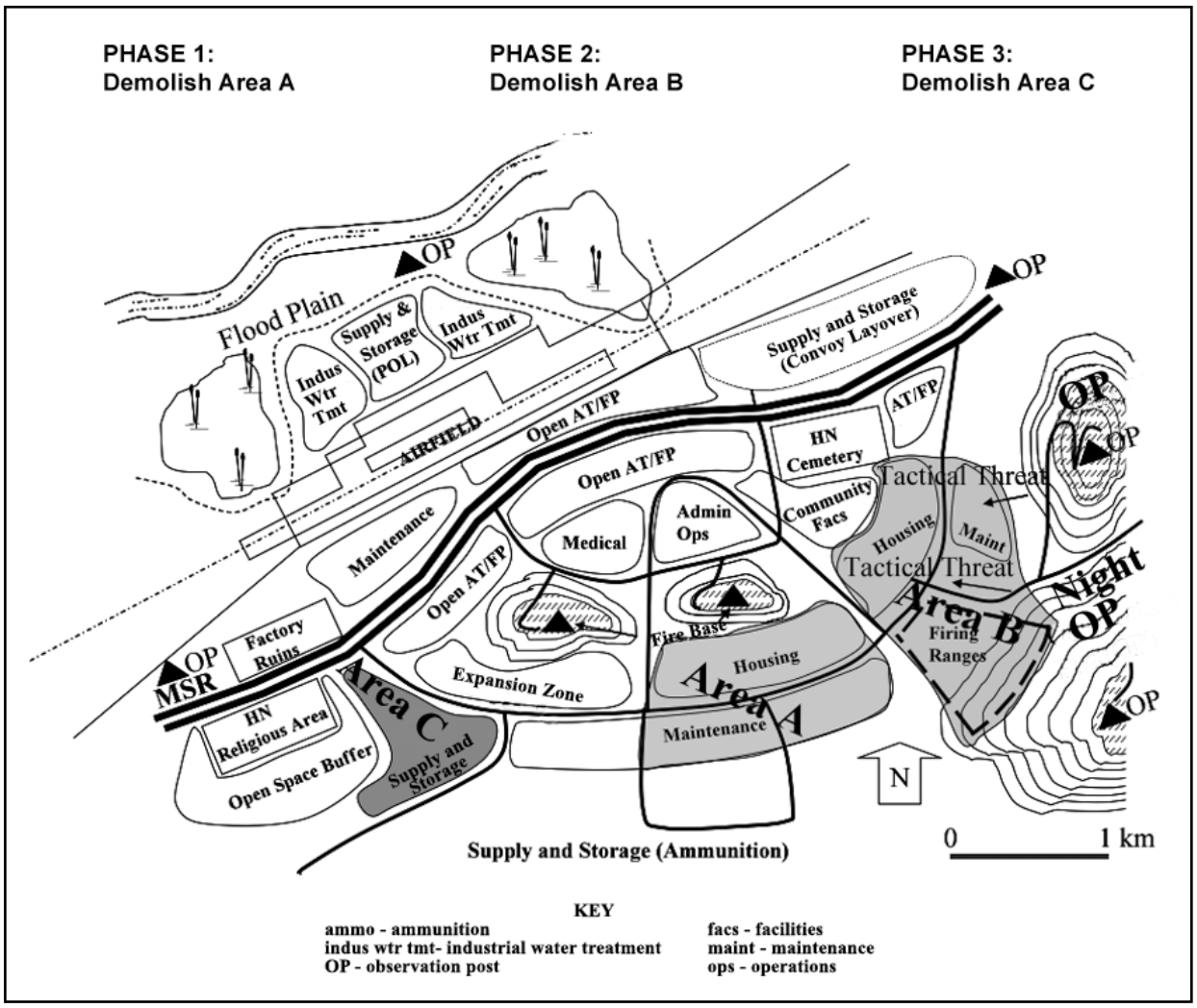

Figure H-3. Phasing plan, total land area

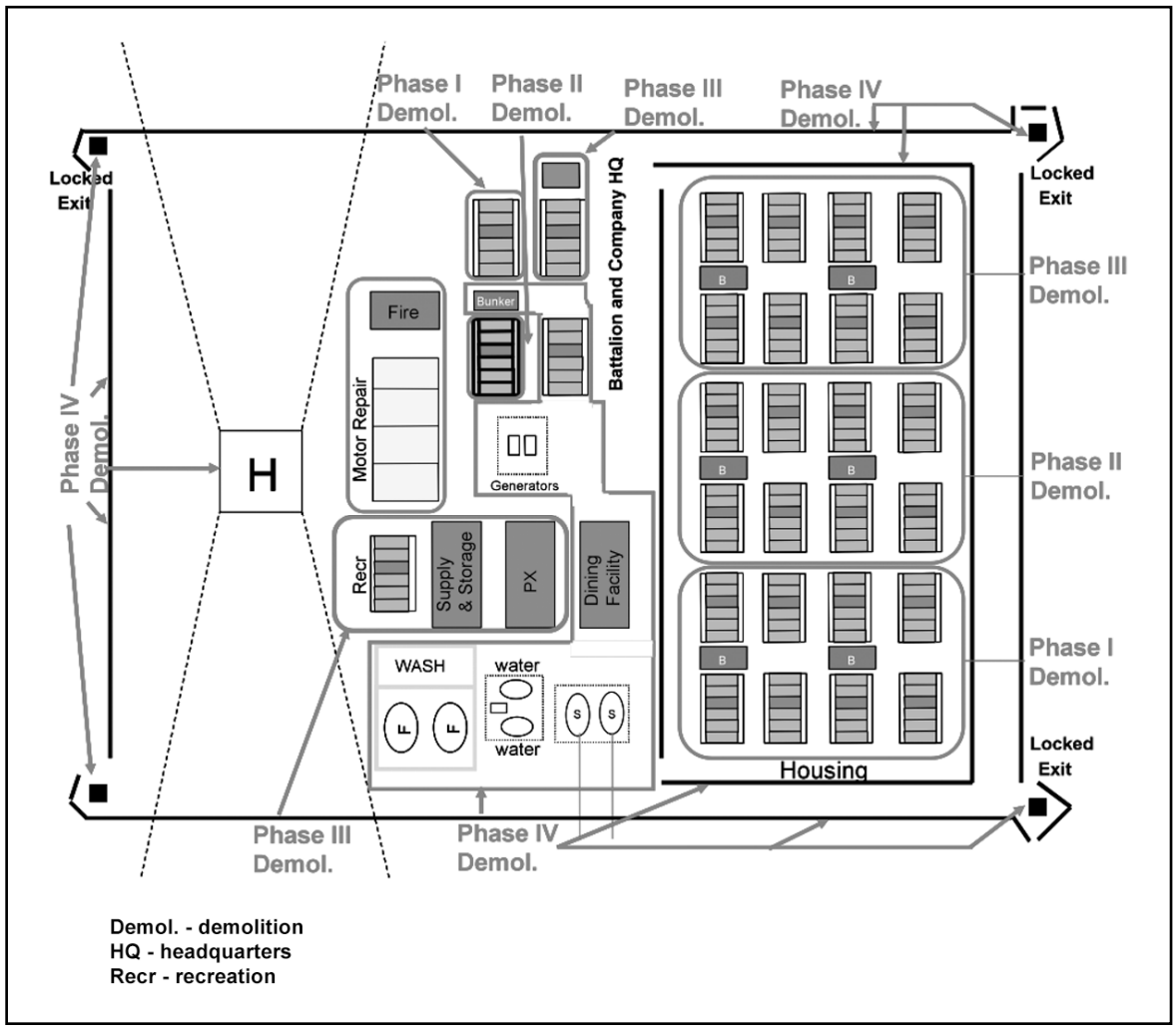

Figure H-4. Phasing plan, built-up areas

APPENDIX I

Selected Environmental Considerations Associated With Base Camp Planning, Operation, Cleanup, and Closure

I-1. General. This appendix provides base camp planners, operators, and users with checklists on integrating key environmental considerations in the planning, construction, operation, cleanup, and closure of base camps.

a. Environmental related reports. Key environmental reports associated with base camps include the EBS, the EHSA, and the ECR.

(1) The EBS is conducted during location selection before occupation or as soon as possible after occupation. An EBS and an EHSA are essential in identifying preoccupation environmental conditions for the protection of troop health and safety and for the protection of U.S. interests from spurious claims at closure. An EBS is required as soon as practicable after a base camp location has been approved. The environmental management officer (EMO), an engineer representative, an EnvST, or a contractor managed by the base camp commander conducts the EBS. Ideally, the EBS should be performed as part of the location selection process in order to minimize future challenges. The EMO should confirm the existence of an EBS for all U.S. locations in the area of responsibility. The base camp commander or the EMO should ensure that copies of all EBSs are forwarded to the theater engineer and the appropriate Staff Judge Advocate (SJA) office. Ultimately, the theater engineer should ensure that the EBS is forwarded to USACHPPM. A comprehensive EBS would include consideration of the following potential influences upon the environment:

- Observed spills or soil staining.
- Sewage and sanitary waste disposal.
- Water supply and wastewater discharge.
- Garbage and HW collection and disposal.
- Underground and above ground fuel storage tanks.
- Drums and containers of HM.
- Stored munitions or UXO.
- Any additional features and conditions that are considered significant to existing baseline conditions; for example, the presence of historic, cultural, or religious features, facilities, and customs that would affect, or be effected by, the base camp.

(2) The EHSA is typically conducted in conjunction with or as soon as possible after the EBS as the two documents support each other. The EHSA determines if environmental contaminants from current or prior land use, disease vectors, or other environmental health conditions could pose health risks to personnel at deployment sites; therefore, it should be completed as part of the site selection. It also identifies industrial facility operations and commodities near the site that could, if damaged or destroyed,

release contaminants harmful to personnel. While the EBS is generally more visual and engineer-related, the EHSA is more analytical (including a greater variety and detail of sampling), with a greater focus on health hazards. The assessment is typically accomplished by medical personnel familiar with environmental conditions that could adversely impact operations associated with base camp functions. Like the EBS, copies of the EHSA should be forwarded to the theater engineer and the appropriate SJA office.

(3) The ECR is conducted before property turnover. An ECR is essential in documenting postoccupation environmental conditions to help protect U.S. government liability for pollution or other adverse environmental impacts that occur after departure from the base camp. The EMO or designated representative prepares the ECR in exact comparison with the previously prepared EBS and EHSA. Every topic presented in the EBS and the EHSA is addressed and reported in the ECR. If samples were taken and analyzed in the EBS and the EHSA, samples should be taken from the same locations and analyzed by the same procedures as a part of the ECR process. There may also be additional areas of concern that require sampling and analysis if the U.S. presence has significantly altered the environment. The ECR, the EBS, and the EHSA are maintained by the base camp and are archived by higher headquarters and USACHPPM for use by real estate personnel and/or the SJA. The base camp commander or the EMO should ensure that copies of all ECRs are forwarded to the theater engineer and the SJA Claims Office.

b. Environmental facilities and standards established herein apply to the three durations (based on the expected life span of the base camp) as defined in Chapter 1. The decision matrix shown at Table I-1 summarizes key environmental facilities, practices, procedures, documentation, and standards based on three construction standards.

Table I-1. Concept of operations environmental management matrix

	Initial Standard (0 – 6 months)	**Temporary Standard (6 - 24 months)**	**Semipermanent Standard (>24 months)**
Site Environmental Documentation	EBS, EHSA, ECR, and joint assessment	EBS, EHSA, ECR, and joint assessment	EBS, EHSA, ECR, and joint assessment
Potable Water Sources	Bottled water/water points, wells, and other potable water production and pressurized water distribution systems or Force Provider	Wells/treatment plants/purchase locally with the approval of the theater engineer	Wells/treatment plants/purchase locally with the approval of the theater engineer
Nonpotable Water Use	Dust control and wash racks, irrigation, toilets	Dust control and wash racks, irrigation, toilets, grease trap cleaning	Dust control and wash racks, irrigation, toilets, grease trap cleaning

Table I-1. Concept of operations environmental management matrix

	Initial Standard (0 – 6 months)	Temporary Standard (6 - 24 months)	Semipermanent Standard (>24 months)
Wastewater	Toilet—organic equipment, burn barrels, facultative lagoons/ Force Provider Gray water—discharge to facultative lagoons, municipal or camp wastewater treatment plant (WWTP)	Toilet—wastewater from ablution (AB) units or latrines to austere treatment facility Gray water—discharge to facultative lagoons, municipal or camp WWTP	Toilet—wastewater to WWTP from latrines/AB units or masonry/prefabricated buildings Gray water—discharge to facultative lagoons, municipal or camp WWTP
Sewage Sludge	N/A	N/A	Contract off-site disposal, land apply and or compost if practical
Grease Traps	N/A	Required for DFAC and gray water—dispose of grease via anaerobic digester, contract disposal, or compost	Required for DFAC and gray water—dispose of grease via anaerobic digester, contract off-site disposal, or compost
Hazardous Waste	Defense Reutilization Marketing Service – International (DRMS-I), petroleum contaminated waste (PCW) treatment, oil blending	DRMS-I, PCW and PCS treatment, oil blending	DRMS-I, PCW and PCS treatment, oil blending
Spill Response Planning	Unit standing operating procedure (SOP); spill prevention, control, and countermeasures (SPCC) plan; spill response plan; and equipment and reporting	Unit SOP, SPCC, spill response plan, and equipment and reporting	Unit SOP, SPCC, spill response plan, and equipment and reporting
Spill Cleanup	POL Sheen Field Test, 2,000 parts per million (ppm) total petroleum hydrocarbons (TPH) for JP-8 turbine fuel, 10 ppm for gasoline	POL Sheen Field Test, 2,000 ppm TPH for JP-8, 10 ppm for gasoline	POL Sheen Field Test, 2,000 ppm TPH for JP-8, 10 ppm for gasoline
Petroleum Contaminated Soil	Clean up using spill cleanup standards above, then use DRMS-I contract for off-site disposal	Clean up using spill cleanup standards above, then DRMS-I, contract off-site disposal—land, farm, or biopile	Clean up using spill cleanup standards above, then DRMS-I, contract off-site disposal—land, farm, or biopile

Table I-1. Concept of operations environmental management matrix

	Initial Standard (0 – 6 months)	Temporary Standard (6 - 24 months)	Semipermanent Standard (>24 months)
Petroleum Contaminated Water	Sorbant treatment, Defense Logistics Agency (DLA) or contract off-site disposal; limit emulsions	Sorbant treatment, DLA, contract off-site disposal, or oil-water separator (OWS); limit emulsions	Sorbant treatment, DLA, contract off-site disposal, or OWS; limit emulsions
Infectious Waste	Contract off-site disposal, transport back to home station or to a two-stage incinerator	Contract off-site disposal, transport back to home station or to a two-stage incinerator	Contract off-site disposal, transport back to home station or to a two-stage incinerator
Natural Resources and Endangered Species	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts
Archeological, Historic, Cultural, and Religious Features and Facilities	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts	Obtain lists, survey base camps, limit impacts
Requests for deviation from this standard would be submitted in writing through the theater engineer to the deputy theater commander for approval.			

I-2. Environmental Checklist. Table I-2 shows an environmental checklist for proposed actions. It is imperative that the proper documentation resulting from actions associated with the checklist be forwarded to the appropriate command and distributed further as necessary.

Table I-2. Environmental checklist for proposed actions

1.	**AIR QUALITY**	
	a.	Does the base camp have existing air pollution emissions?
	b.	Will the proposed action involve air pollution discharges?
	c.	Are there actions and areas for which remediation is not possible?
2.	**WATER RESOURCES**	
	a.	Have waters/wetlands been identified?
	b.	Does the proposed action involve construction/demolition or other work involving—

Table I-2. Environmental checklist for proposed actions

	(1)	Excavation or fill in HN waters?
	(2)	Operations to modify navigable waters?
	(3)	The discharge of dredged or fill materials?
	c.	Has the 100-year floodplain been delineated?
	d.	Does the proposed action involve construction in or otherwise affect the 100-year floodplain?
	e.	Does the proposed action involve—
	(1)	A pollution discharge?
	(2)	Storm water runoff?
3.	**ARCHEOLOGICAL, HISTORIC, CULTURAL, AND RELIGIOUS RESOURCES**	
	a.	Have surveys of archeological and historic resources been conducted?
	b.	Have historic structures and buildings 50 years and older been identified?
	c.	Have known archeological sites and areas of the base camp with high potential been located?
	d.	Will the proposed action affect archeological, historic, cultural, or religious features, facilities, or infrastructure?
4.	**ENDANGERED SPECIES**	
	a.	Are endangered or threatened species present?
	b.	Have endangered species surveys been conducted on the base camp?
	c.	Have endangered species surveys been conducted in the surrounding area?
	d.	Will the proposed action affect endangered or threatened species?
5.	**NATURAL RESOURCES**	
	a.	Will the proposed action affect natural resources?
	b.	Have various natural resource management areas been identified?
6.	**NOISE**	
	a.	Has a base camp Installation Compatibility Use Zone noise study been conducted?
	b.	Have areas where noise levels affect land use been identified?
	c.	Will the proposed action affect noise levels?
7.	**HAZARDOUS MATERIALS/WASTES**	
	a.	Does the proposed action involve the use of HM?
	b.	Will the proposed action generate HW?
	c.	Have arrangements been made with the DRMS-I for the disposal of HM/HW?

Table I-2. Environmental checklist for proposed actions

8.	**ENVIRONMENTAL DOCUMENTATION**	
	a.	Has the EBS and/or the EHSA been conducted?
When it is known that a base camp will close—		
	b.	Has the joint assessment/preliminary environmental assessment been conducted?
	c.	Has the ECS been conducted?
Upon closure of the base camp—		
	d.	Has the ECR been prepared and submitted to the theater engineer and the theater SJA Claims Office as a part of the base camp cleanup and closure archive?

GLOSSARY

Acronyms and Terms

Section I
Acronyms:

AAFES	Army and Air Force Exchange Service
AFCESA	United States Air Force Civil Engineering Support Agency
AFDD	Air Force doctrine document
AFR	Air Force regulation
AHA	ammunition holding area
AO	area of operation
AR	Army regulation
ASP	ammunition supply point
AT/FP	antiterrorism/force protection
BCCAT	base camp closure assessment team
BCCO	base camp closure organization
BCDP	base camp development planning
BCT	brigade combat team
BDSP	base camp development site plan
BIS	building information schedule
BSB	brigade support battalion
C2	command and control
CADD	computer-aided drafting and design
CCDR	combatant commander
CCR	Central Command regulation
COA	course of action
CP	command post
CREST	contingency real estate support teams
DA	Department of the Army
DFAC	dining facility
DOD	Department of Defense
DOS	Department of State
DRMS	Defense Reutilization Marketing Service
EBS	environmental baseline survey
ECP	entry control point
ECR	environmental conditions report
EHSA	environmental health site assessment
EI2RC	Engineering Infrastructure and Intelligence Reachback Center
EMO	environmental management officer
EnvST	environmental support teams
EOD	explosive ordnance disposal
EP	engineering pamphlet
EPW	enemy prisoner of war
FEMA	Federal Emergency Management Agency

FEST	forward engineer support team
FFE	field force engineering
FGS	final governing standards
FM	field manual
FOB	forward operating base
G-3	Assistant Chief of Staff for Operations and Plans
GTA	graphic training aid
HAZ MART	hazardous materials mart
HBCT	heavy brigade combat team
HHC	headquarters and headquarters company
HM	hazardous material
HN	host nation
HQDA	Headquarters, Department of the Army
HQUSACE	Headquarters, United States Army Corps of Engineers
HW	hazardous waste
I/R	internment/resettlement
ISB	intermediate staging base
J-3	Joint Staff Operations Directorate
JAG	Judge Advocate General
JCC	Joint Contracting Command
JCOB	joint contingency operations base
JFOB	joint forward operating base
JP	joint publication
LNO	liaison officer
LOC	lines of communication
MCX	Mandatory Center for Expertise
MDMP	military decision-making process
MP	military police
MSR	main supply route
MTOE	modified table of organization and equipment
MWR	morale, welfare, and recreation
NAF	nonappropriated fund
NAVFAC	Naval Facilities Engineering Command
NBC	nuclear, biological, and chemical
NGO	nongovernmental agency
NTTP	Navy tactics, techniques, and procedures
OE	operational environment
OPLAN	operation plan
OPORD	operation order
PCS	petroleum-contaminated soils
PDF	portable document format
POC	point of contact
POL	petroleum, oils, and lubricants
PX	post exchange
RFI	request for information

ROWPU	reverse osmosis water purification unit
RPI	real property inventory
RTLP	Range and Training Land Program
S-1	human resources staff officer
S-3	operations staff officer
S-4	logistics staff officer
SAP	satellite accumulation point
SEAHUT	Southeast Asia hut
SECDEF	Secretary of Defense
SJA	Staff Judge Advocate
SME	subject matter expert
SOFA	status-of-forces agreement
TAB	tabulation of existing and required facilities
TCMS	Theater Construction Management System
TDA	table of distribution and allowances
TIC	toxic industrial chemical
TIM	toxic industrial material
TM	technical manual
TO	theater of operations
UFC	unified facilities criteria
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAREUR	United States Army Europe
USCENTCOM	United States Central Command
UXO	unexploded ordnance

Section II
Terms:

assumption
A supposition on the current situation or a presupposition on the future course of events, either or both assumed to be true in the absence of positive proof, necessary to enable the commander in the process of planning t complete an estimate of the situation and make a decision on the course of action. (FM 5-0)

base
A locality from which operations are projected or supported. (JP 3-10)

base camp
An evolving military facility that supports the military operations of a deployed unit and provides the necessary support and services for sustained operations. See Chapter 1 of this EP.

base camp development planning
A time-sensitive and mission-driven, cyclical planning process that determines and documents the physical layout of properly located, sized, and interrelated land areas, facilities, utilities, and other factors to achieve maximum mission effectiveness, maintainability, and expansion capability in theater. See Chapter 2 of this EP.

base camp development site plan
An overlay or graphic design of the physical layout of the required facilities and infrastructure, dimensioned-to-scale with plan-view outlines of the proposed buildings and site improvements with necessary topographic features. See Chapter 9 of this EP.

constraints
Restrictions placed on the command by a higher command. A constraint dictates an action or inaction, thus restricting the freedom of action a subordinate commander has for planning. (FM 5-0)

environmental health and safety assessment
An assessment to determine past, present and future environmental , health, and safety risks associated with land use, disease vectors, and environmental contamination caused by hazardous materials, hazardous wastes, and other health and safety related condition. See Chapter 10 of this EP.

forward operating base
An area used to support tactical operations without establishing full support facilities. (FM 3-0)

facts
Statements of known data concerning the situation, including enemy and friendly dispositions, available troops, unit strengths, and materiel readiness. (FM 5-0)

general site planning
Finding and plotting, to scale, a logical location for every aboveground area, facility, and infrastructure requirement, along with the portrayal of the various, often invisible, major utility corridors, safety clearance zones, and various boundaries that influence and support the base camp development plan. See Chapter 9 of this EP.

implied task
A task that must be performed to accomplish a specified task or the mission, but is not stated in the higher headquarters order. (FM 5-0)

intermediate staging base
(DOD) A tailorable, temporary location for staging forces and sustainment and extraction into and out of an operational area. (JP 3-34)

land use planning
The process of calculating, mapping, and planning the allocation of land areas based on general use categories, mission analysis, functional requirements, functional interrelationships, standards, criteria, and guidelines. See Chapter 6 of this EP.

location selection
The process of evaluating a series of possible locations for a base camp. See Chapter 5 of this EP.

master planning
A continuous analytical process which involves evaluation of factors affecting the present and future development of an installation. (TM 5-803.1)

military decision-making process
A planning tool that establishes procedures for analyzing a mission, developing, analyzing, and comparing courses of action against criteria of success and each other, selecting the optimum course of action, and producing a plan or order. (FM 5-0)

necessity
Whether the assumption is essential for planning. If planning can continue without the assumption, it is not necessary and should be discarded. (FM 5-0)

specified task
A task specifically assigned to a unit by its higher headquarters. (FM 5-0)

stability operations
(DOD) An overarching term encompassing various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment and provide essential government services, emergency infrastructure reconstruction, and humanitarian relief. (JP 3-0)