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Small-Base Entry Control Point Guide:

A Practical Guide For The Small-Base Leader

FIRST EDITION - APRIL 2012

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INTRODUCTION

Regardless the threat level, entry control points (ECP) must remain a functional part of the forward operations base (FOB) perimeter security and access control system. The ECP objective is to prevent unauthorized personnel and vehicle access while maximizing traffic flow for authorized access.

An ECP should be designed and operated with a defense-in-depth concept that uses elements of distance and time to afford ECP personnel the opportunity to safely assess and react to threats. It should also employ barriers and other technologies to increase protection to personnel operating the ECP.

A properly designed and operated ECP provides:

- □ Security for the small-base
- □ Protection for ECP security forces
- □ A safe traffic environment for personnel and vehicles entering and leaving the base
- □ Traffic flow capability that does not compromise safety, security, or base operations or negatively impact off-base pedestrian or vehicle traffic flow
- □ A professional image of protection and security that deters possible aggressors and enhances the image of security for the local nationals

This GUIDE is intended to provide the small-base leader with ECP planning, design and operational considerations and technology solutions for use when building a new ECP or upgrading an existing ECP.

In December 2009, the Joint Entry Control Point & Escalation of Force Procedures (JEEP) Handbook was released. This GUIDE does not duplicate the topics discussed in the JEEP Handbook, instead, the GUIDE presents information specific to small-bases that was not detailed in the JEEP Handbook.

APPLICABILITY

The experience of small-base leaders can vary widely. Small-base leaders are often multi-tasked and may not have received specific training on the planning, design, construction and operation of ECPs. As indicated by the title, the information in this GUIDE is intended for small-base leaders that may be required to:

- □ Plan, design, build and operate a new ECP
- □ Improve and operate an existing ECP

The information provided may also be useful to personnel manning the ECP.

ASSUMPTIONS

For the purposes of this GUIDE, small-bases are defined as:

- □ Populations less than 200 personnel
- □ At various stage of development (times are approximate):
    - Initial: In place less than 6 months
    - Temporary: In place 6 – 12 months
    - Semi-permanent: In place more than 12 months
- □ Tenant units may be kinetic or non-kinetic and may include CIA, State Department, indigenous military units and others
- □ Limited logistics capability that restricts ability to obtain complex security systems and equipment
- □ Concerned about a range of threats from snipers to Vehicle-Bourne Improvised Explosive Devices (VBIEDs), Person-Bourne Improvised Explosive Devices (PBIEDs) and direct assault

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CHAPTER 1
SMALL-BASE ECP PLANNING

> ***"It is not always true, of course, that insurgents will avoid a 'hard target.' But it has always been true that insurgents in sight of a 'soft target' can more easily exploit it."***
>
> ***General David Petraeus***

ECP planning is a continuous process impacted by threat likelihood and tactics, site location and layout, small-base and ECP mission, design and construction, and type of personnel and protected assets located on the small-base. Planning for ECP design and operations should follow the Joint Operation Planning Process (JOPP) or specific Service planning guidance. The details of the planning process depend on whether a new ECP is being established or an existing ECP site occupied.

New ECP planning requires time, but provides the opportunity to include protective measures from the outset instead of retrofitting later after the ECP has been built. Conversely, the assessment of an existing ECP may reveal needed improvements, some of which might not be fully attainable and may require workarounds to improve security. Regardless, it is more cost effective to establish security measures during the planning and design process than it is to apply measures after the fact.

PLANNING FOR A NEW ECP

> ***"We often give our enemies the means of our own destruction".***
>
> ***Aesop***
>
> ***Case study: Originally established as a base for a Provincial Reconstruction Team in 2006, Combat Outpost Keating was located deep in a bowl in Nuristan Province, surrounded by high ground, with limited overwatch protection. It was attacked Oct 2009 resulting in 9 American KIA.***

The planning process for a new small-base ECP will be different from that used when occupying an established ECP. Planning for the new small-base will normally involve selecting a site for the ECP. New ECP planning should include the following:

STEP 1: Develop a clear and concise ECP mission

The primary mission of the ECP is to ensure protection of personnel and assets against unauthorized entry. The ECP mission will be driven by the small-base mission, which may include operations that require access by other than mission-essential personnel and trusted vehicles (military vehicles), such as local nationals (LNs) and other vehicles (commercial delivery), or both. The ECP may also serve as the primary interface with the local populace. In this case the ECP must provide a professional and positive impression and the mission must balance the requirement of maintaining protection with community engagement.

Example Mission Statement: (Who) ECP personnel (What) will control access of individuals, equipment and vehicles (Where) to Combat Outpost XXX (When) on a continuous basis (Why) to prevent enemy access, mitigate an enemy attack, intercept contraband and maintain force protection. (Who) ECP personnel (What) will maintain a professional, unbiased and respectful attitude (Where) at the ECP (When) when interfacing with local nationals (Why) to encourage community engagement and present a positive image to the local community.

STEP 2: Conduct an ECP threat assessment

Threat assessments should be conducted periodically, or as needed, for each small-base. The overall small-base threat assessment should address specific threats that would likely be directed toward the ECP. If the threat assessment has not addressed ECP-specific threats then an ECP threat assessment must be conducted. The outcome of the threat assessment will influence the design and operations of the ECP. An ECP threat assessment should concentrate on the following:

- ☐ Define and understand the assigned area of operations
  - What is the primary mission in the area of operation (AO)?
  - What is the current threat situation in the AO?
  - What is the history of attacks in the AO?
  - What specific attacks to ECPs have occurred in the AO?

- ☐ Describe the environment that will affect the design and operation of the ECP
  - How would the weather/climate affect enemy operations?
  - How would the natural and man-made terrain help/hinder the enemy (especially road networks)?
  - What are the local demographics, culture, history and customs?
  - Will Local Nationals (LN) need to access the base for work, meetings, deliveries, etc.?

- ☐ Evaluate the enemy
  - Who are the individual actors, groups and where are they located?
  - How are they organized and what are their goals?
  - What are their capabilities and limitations for planning, coordinating and executing an attack against your base?
    - Number and training of personnel
    - Technology and communications
    - Weapons and their capabilities
    - Tactics, Techniques and Procedures (TTP)
    - Frequency and timing of attacks
    - Target selection process
  - What is the history and type of attacks against ECPs in the AO?

- ☐ Determine threat courses of action that the enemy would use against the ECP
  - Consider and prioritize the following threat courses of action (COA)/tactics in order to focus the ECP design and operations. Also, consider the adaptability of the enemy and possible worst case scenarios. As a baseline consider the following enemy tactics:

- Surveillance and reconnaissance (part of all enemy COAs)
- Covert entry to probe the ECP and gather information on its layout, operational procedures and technology
- Disruptive attack or demonstration outside the ECP (to gather information on ECP response)
- Vehicle-borne IED (VBIED) direct attack on the ECP and visitor personnel or to breach the perimeter to allow a subsequent attack inside
- Person-borne IED (PBIED) attack on ECP and visitor personnel or as a means to breach the perimeter
- Direct fire (Rocket Propelled Grenades (RPG), sniper, small arms attacks) attack on ECP personnel and visitors or an attempt to defeat the ECP and gain entry to the base
- Complex attack using a combination of two or more of above

- Consider local intelligence and significant acts in the AO. Note any recent or predicted changes to enemy TTPs in the assigned and broader AO.

STEP 3: Perform a site selection survey and assess potential risks to the ECP

The site selection survey identifies potential vulnerabilities to address and avoid in the design and operations of the ECP. The TOOLS chapter provides an example of a site selection checklist that can be used as needed. The TOOLS chapter also provides an ECP Risk Worksheet. The purpose of these worksheets is to help identify the risk level to the ECP associated with identified enemy threats and the actions that will reduce risk.

STEP 4: Develop an overall concept for the design and operation of the ECP that reduces risk

The basic concept for a small-base ECP is to maintain a defense-in-depth by incorporating the operational objectives of deter, deny, detect, assess, delay, defend and defeat. See the DESIGN and OPERATIONS chapters for additional information for developing an overall concept.

STEP 5: Develop the specific design of the ECP

Allow for continual improvement and change in the design of the ECP to increase protection and adapt to new enemy tactics. The DESIGN chapter provides a detailed discussion on essential design concepts and considerations.

STEP 6: Construct the ECP and develop an ECP Standard Operating Procedure (SOP)

Establish a priority of effort for the construction of a new ECP. The focus should be on immediately providing initial protection and maintaining operational capability. Improved capabilities and protection can then be implemented as more resources become available. The DESIGN chapter provides additional information concerning ECP construction sequence. Simultaneously, create an ECP SOP. SOPs should reduce risk and include random operational procedures to make it more difficult for the enemy to identify routines and plan attacks. SOPs should be continually reviewed. The OPERATIONS chapter provides additional information concerning the operation of a small-base ECP.

PLANNING FOR AN EXISTING ECP

The planning process for an existing ECP is different from that used when establishing a new base. The primary difference is that the site location and layout of the ECP are already established. In some cases these may be far from ideal in terms of force protection. One of the main parts in the planning process in this case will be to identify any existing vulnerabilities. The steps below facilitate existing ECP planning:

Step 1: Validate the ECP mission statement

The ECP mission is driven by the missions of the individual units and tenants that occupy the small-base and whether operations require access by only mission-essential personnel and trusted vehicles or additional access by LNs and other vehicles. The ECP may also serve as the primary interface with the local populace. In this case, the mission should balance the requirement of maintaining force protection with community engagement. Ensure that established security and access control measures are mission-consistent and do not adversely impact small-base operations.

Step 2: Validate the threat assessment

Ensure the threat assessment is current and specific to the AO, small-base and ECP. Update the assessment if needed. Identify and prioritize likely threat courses of action/tactics that could be used against the ECP. Also, identify worst case scenarios and the impact of threat tactics on ECP design and operations. Consider the following when validating the threat assessment:

□ Is there an existing and current threat assessment?

□ Does it identify the threats to the base in general and the ECP specifically?

□ Does it include how the environment affects the threat and enemy operations?
- Weather/climate
- Natural and man-made terrain (especially road networks)
- Local demographics, culture, history and customs
- LNs need to access base for work, meetings, deliveries, etc.

□ Does it evaluate the enemy?
- The individual actors and groups and where are they located
- Their organization and goals
- Their capabilities and limitations for planning, coordinating and executing an attack against your base:
    - o Number and training of personnel
    - o Technology and communications
    - o Weapons and their capabilities

- o TTPs
- o Frequency and timing of attacks
- o Target selection process
- o The history and type of attacks in the AO

□ Does it identify and prioritize threat courses of action that the enemy would use against the ECP? Does it identify the worst case scenario? As a baseline, does it consider the following tactics:

- Surveillance and reconnaissance (really part of all enemy COAs)
- Covert entry to probe the ECP and gather information on its layout, operational procedures and technology
- Disruptive attack or demonstration outside the ECP (to gather information on ECP response)
- VBIED direct attack on the ECP and visitor personnel or to breach the perimeter to allow a subsequent attack inside
- PBIED attack on ECP and visitor personnel or as a means to breach the perimeter
- Direct fire (RPGs, sniper, small arms attacks) attack on ECP personnel and visitors or an attempt to defeat the ECP and gain entry to the base

□ Does it consider local intelligence and significant actions in the AO and any recent or predicted changes to enemy TTPs in the assigned AO?

□ Have areas of enemy support in the local population or enemy locations been identified on maps or imagery of the site?

□ Have potential enemy avenues of approach been identified on maps or imagery of the site?

Step 3: Conduct a vulnerability assessment and assess potential risks to the ECP

Identifying vulnerabilities is essential to strengthening the ECP's protection posture. Vulnerability and risk assessments identify and prioritize needed changes to the ECP design and operations. The TOOLS chapter provides an ECP Vulnerability Assessment Checklist and an ECP Risk Worksheet. These worksheets do not cover all possible issues or situations and should be tailored to the specific ECP site to enhance their capability.

ECP vulnerabilities are identified as either procedural or programmatic. Procedural vulnerabilities are due to inadequate or non-existent operational procedures or personnel not following procedures due to insufficient training. These vulnerabilities can be mitigated by changing or adopting new procedures and ensuring ECP security personnel are trained. Programmatic vulnerabilities are those caused by inadequate ECP design features or the lack of proper material, equipment, and an adequate number of ECP security personnel. Programmatic vulnerabilities can be mitigated through design changes, procurement of equipment and material, and assignment of additional personnel. Identifying vulnerabilities should be a continuous process. ECP security personnel should be tasked with identifying potential weakness in ECP design and operations and recommending solutions.

Concentrate on the following when conducting vulnerability and risk assessments of the ECP:

□ **Identify ECP elements**
- Personnel (number, training, experience, discipline, operations)
- Layout (standoff, lanes, location relative to external roads and buildings and to internal assets)
- Structures (barriers, gates, speed bumps, fighting positions, overwatch, inspection areas)
- Equipment (search/scanning, signs, personnel, power, etc.)

- ☐ **Identify weaknesses/vulnerabilities of elements against likely threat tactics**
  - Review any previous ECP and site vulnerability assessments or site surveys
  - Use the ECP Vulnerability Assessment checklist in the TOOLS chapter as a guide

- ☐ **Estimate the overall event likelihood for each tactic**

  Consider the likely threat tactics against the ECP and the identified vulnerabilities of the ECP. For example, if sniper attacks are prevalent and ECP personnel are exposed with direct line-of-site and no counter-surveillance methods are used, then the likelihood of this event occurring is high. However, if the ECP is on the high ground with no direct line-of-site, then the event likelihood would be low. (See ECP Risk Assessment Worksheets in the TOOLS chapter)

- ☐ **Estimate the consequences of an attack**

  Estimate number of fatalities, number of injuries, equipment damage and mission degradation. For example, if the enemy scenario is for a PBIED to gain entry to the dining facility, then the consequences may be significant (10 fatalities, 20 injuries, loss of dining facility and significant mission degradation). (See ECP Risk Assessment Worksheets in the TOOLS chapter)

- ☐ **Determine the overall risk for each threat tactic that might be employed against the ECP**

  Risk is the combination of attack likelihood and severity of the estimated consequences. For example, if the PBIED attack is a common tactic, but the ECP isolates individuals in a protected enclosure and thoroughly searches them from a distance using infrared (IR) scanners then the attack likelihood could be considered low. If the PBIED detonates, the consequences could be low. In this case the risk will also be low. (See ECP Risk Assessment Worksheets in the TOOLS chapter)

Step 4: Validate the overall concept for the ECP

Ensure that the overall ECP concept supports the ECP and small-base mission and has taken into account the current threat and provides defense-in-depth incorporating the operational objectives of deter, deny, detect, defend and defeat.

Step 5: Validate the specific design of the ECP

Modify the ECP design as needed to reduce identified vulnerabilities and risk. Allow for continual improvement and change in the design to increase protection and adapt to new enemy tactics. (See the DESIGN chapter for concepts and considerations to modify an existing ECP)

Step 6: Validate the ECP Standard Operating Procedures

Continually review SOPs to reduce risk and ensure random operational procedures are implemented to make it more difficult for the enemy to plan an attack. Modify the SOP if needed to reduce identified vulnerabilities and risk.

Step 7: Implement ECP modifications

Prioritize modifications to first implement those measures that provide the greatest reduction of risk.

CHAPTER 2
SMALL-BASE ECP DESIGN

> ***"The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable."***
>
> ***Sun Tzu***

The design concepts and considerations presented in this chapter are common to all ECPs. However, no two ECPs are the same and the guidance provided must be adapted and tailored to the specific needs of each base.

The purpose of an ECP is to control access while maintaining the protection measures of the small-base. To achieve these objectives small-base leaders should consider the many influences on ECP design and identify protection requirements early in the design process.

ECP design is normally influenced by competing demands and concerns such as:

- □ Small-base mission
- □ Host nation (HN) requirements
- □ Political constraints
- □ Higher command and Service-specific regulations and guidance
- □ Site selection and terrain constraints
- □ Logistics support and availability of materials

Protection measures should be integrated into the design process early to increase the small-base defensive posture and ability to protect personnel and assets. Early identification of protection and security requirements ensures the ECP design is compatible with overall security efforts and is more cost effective than applying requirements after an ECP is constructed.

DESIGN FUNCTIONAL OBJECTIVES

Functional objectives of a small-base ECP should provide the foundation for the development of the ECP design. The following functional objectives are common to small-base ECPs and should be continuously considered and incorporated into the design process:

Deter - Does the ECP design present a hardened image to an aggressor; one that will discourage and deter an attack?

Detect - Does the ECP design facilitate the detection of possible threats and attempts at unauthorized entry?

Assess - Does the ECP design assist security personnel in assessing the intentions of an unauthorized intrusion or activity?

Deny - Does the ECP design prevent and deny unauthorized entry while providing acceptable level of protection for ECP personnel?

Delay - Does the ECP design make use of the terrain and both natural and man-made barriers to delay intruders?

Defend - Does the ECP design assist personnel in defending against identified threats, to include VBIEDs, PBIEDs, personnel attempting to enter the base with concealed weapons or contraband, snipers or a combination of threats as part of a dedicated attack?

Defeat - Are ECP design features integrated with technologies to defeat the threat?

FUNCTIONAL ZONES

Small-base ECPs that strictly limit access to only mission-essential personnel will normally not require the consideration of functional zones in the design because the functions accomplished in each zone will not be applicable. However, small-base ECPs that must allow other forms of access to personnel or vehicles should incorporate the specific aspects of ECP functional zones into the design.

Small-base ECPs will normally be much smaller in scale. Despite the smaller scale the ECP must still provide the same functions as larger ECPs in order to facilitate access control and enhance the layered defense-in-depth concept. Each functional zone provides specific functions or operations. Functional zones can be considered as buffer areas or transitional spaces between ECP elements. Applicable functional zones for small-base ECPs include the following:

Approach Zone

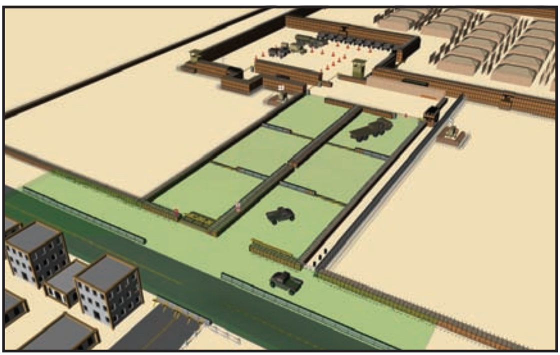


Figure 2-1. Approach Zone

The approach zone (Figure 2-1) is the initial interface between the off-site, public road network and the ECP. The length of the approach zone will be dependent upon:

- Available land/space
- Distance required for traffic queuing and sorting
- If needed, space required for additional traffic lanes to prevent back up onto adjacent public roads
- Space may also be required to support additional speed management techniques to mitigate threats posed by straight-line, high-speed avenues of approach

The approach zone should include design elements that accomplish the following functions and operations:

- Reduce the speed of incoming vehicles through the use of speed management techniques
- Eliminate or reduce straight-line access from local entry/access roads
- Provide adequate stacking distance for vehicles awaiting entry
- Allow for initial verification of authorized access of personnel and vehicles
- Sort traffic by vehicle type; begin containment, segregation and channelization of authorized vehicles and pedestrians
- Enough space to redirect unauthorized vehicles that attempt to enter the ECP

- □ Provide the first opportunity for early warning to identify potential threat personnel and vehicles, including those attempting entry through the outbound lanes of traffic

- □ Provide an off-site parking area for unauthorized vehicles

- □ Maximize the protection of ECP security personnel operating in this zone

Access Control Zone

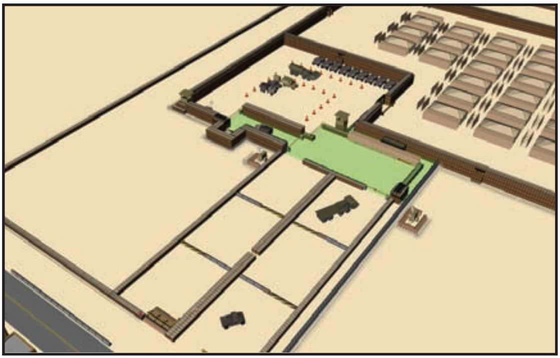


Figure 2-2. Access Control Zone

The access control zone (Figure 2-2) is the main body of the small-base ECP and includes vehicle and personnel search areas, speed/traffic management devices, and overwatch and hardened fighting positions for ECP security forces. The design of the access control zone should be flexible enough to ensure the infrastructure can support future inspection demands, access control equipment, and technologies. The design should include elements that support the following functions and operations:

- □ Maintain small-base defense-in-depth concept

- ☐ Maximize standoff
- ☐ Verification of personnel identification
- ☐ Vehicle turn around and rejection areas
- ☐ Capability to conduct 100 % inspection of personnel and vehicles
- ☐ Nonlinear, serpentine layout with speed reduction and traffic management techniques
- ☐ Containment, segregation and channelizing of vehicle and pedestrian traffic
- ☐ Parking/transfer yard for authorized logistics and delivery vehicles
- ☐ Provide overwatch for the ECP
- ☐ Maximize the protection of ECP security personnel operating in this zone
- ☐ Exit points prevent unauthorized access

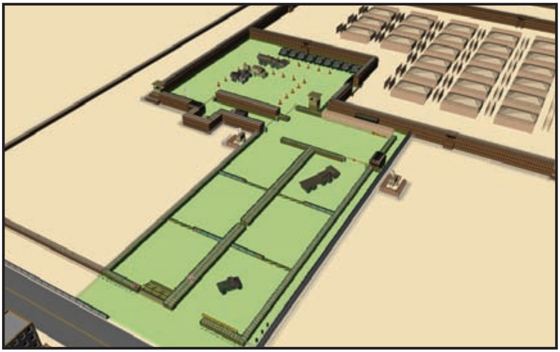


Figure 2.3. Response Zone

The response zone (Figure 2-3) is the area extending from the start of the approach zone to the final denial barrier or gate into the small-base. The response zone should be designed to accomplish the following functions:

- □ Allow time to react to a threat, operate the final denial barrier(s), and close the gate, if necessary
- □ Provide a hardened perimeter gate to act as a final denial barrier
- □ Provide overwatch for the entire ECP
- □ Define the small-base perimeter
- □ Integrate with perimeter security system and maintain defense-in-depth concept

The *JEEP Handbook* (GTA #90-01-018) divides the response zone into Primary and Secondary Response Zones. The primary response zone is located between the approach and access control zones, serving as the ECP engagement area for force escalation. The secondary response zone is co-located with the access control zone and provides a final engagement area and overwatch of the access control zone.

Safety Zone: The safety zone extends from the final denial barrier in all directions to protect FOB personnel from an ECP attack. An acceptable standoff distance must be determined from estimated VBIED and PBIED explosive charge weights based on the threat assessment.

CONCEPTUAL ECP DESIGN

The conceptual design presented below (Figure 2-4) is simply an example of how to implement small-base ECP design concepts. This example is not meant to be “the solution” or the “one-size-fits-all” answer. Small-base leaders can use this example while planning, designing or upgrading their own ECPs. For an ECP to be effective, it is essential that a small-base leader apply the planning and design concepts presented in this GUIDE. It would be too risky to use a one-size-fits-all ECP solution at every small-base; doing so, would result in the enemy eventually discovering how to defeat the ECP.

> **Preferred Method:** The small-base ECP should only be manned or opened when mission-essential personnel and/or trusted vehicles must enter or exit the ECP. This can be accomplished through the use of a combination of movable vehicle and personnel barriers. In order to reduce the speed of incoming vehicles; the recommended method is to design the ECP entrance so that entering vehicles must negotiate a 90 degree turn from the external roadway, a turn that forces entering vehicles to slow down to 10 mph or less. Additionally, the entry should be constructed as a serpentine lane(s) that requires entering vehicles to slow down to negotiate. If other personnel or vehicles must transit the ECP then additional design concepts should be incorporated, such as vehicle and pedestrian search areas, a pedestrian access lane, signage, etc.

While the method discussed above is preferred, it may not be realistic for small-base ECPs. One alternative is for mission-essential/trusted vehicles to be parked in a parking/transfer yard adjacent the ECP and remain under control but outside the interior of the small-base. Another alternative is for mission-essential/trusted vehicles, after being cleared, to proceed inside the small-base so that they are readily available to provide crew-served weapons and armored vehicle response in case of an attack.

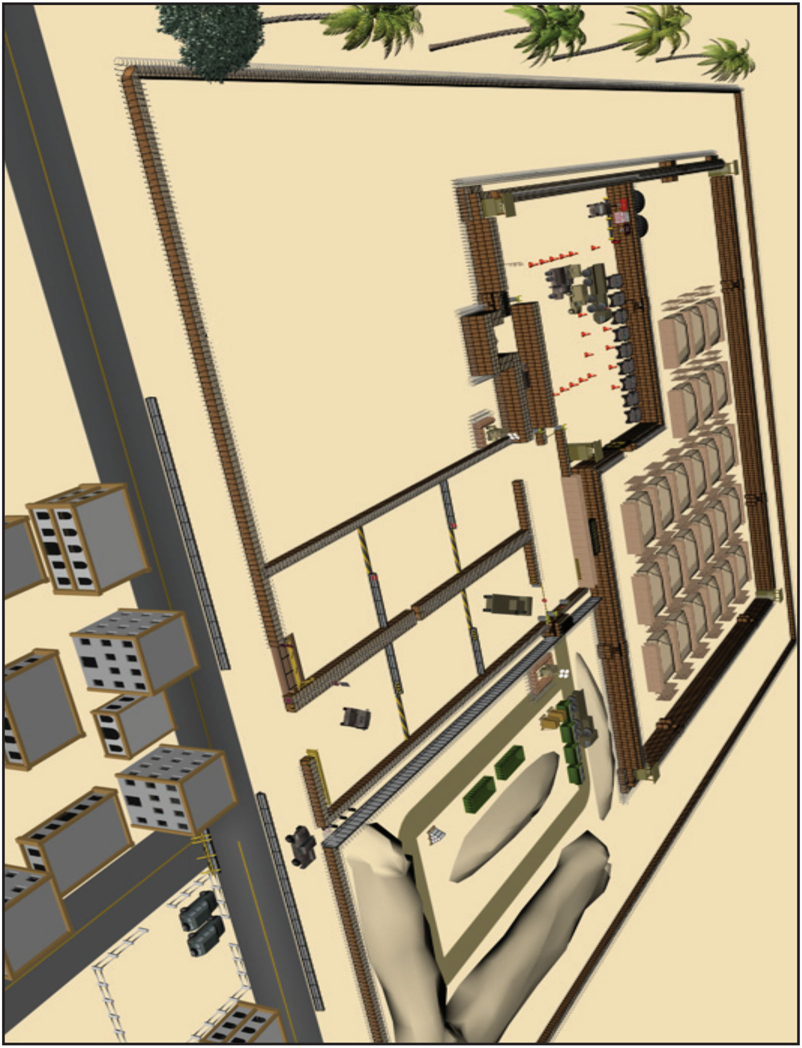
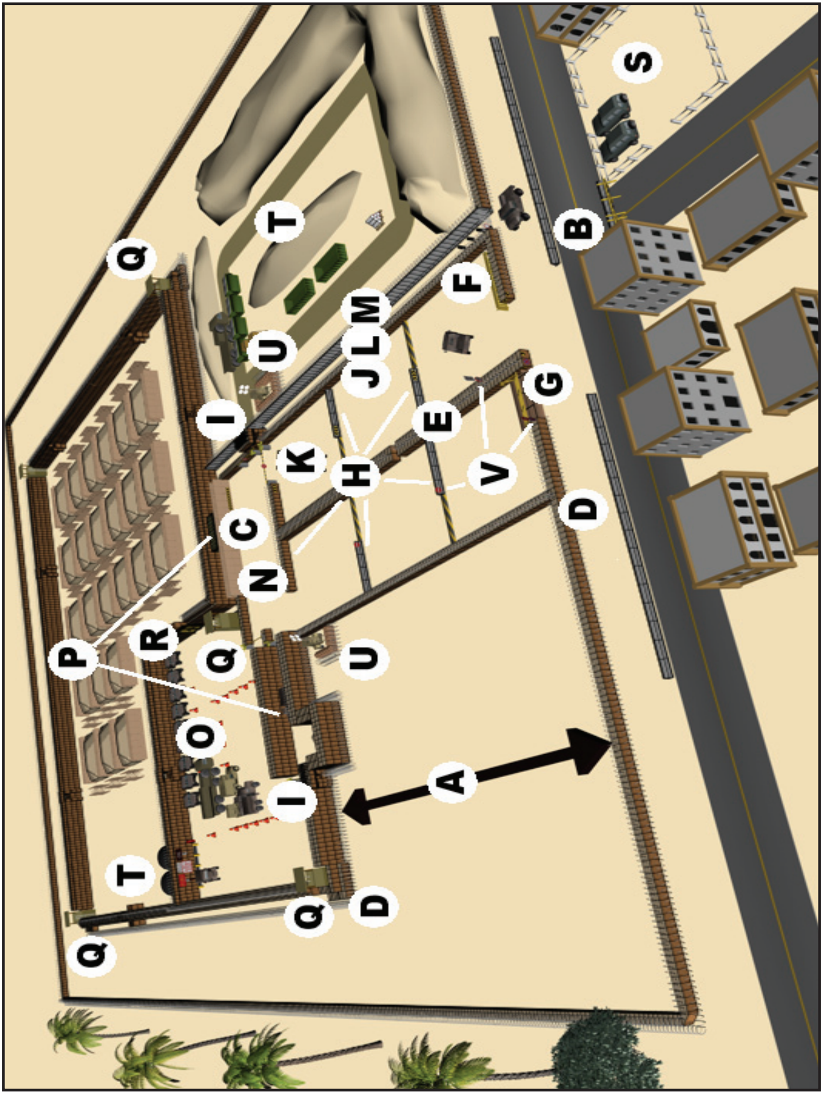


Figure 2-4. Example of ECP Design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DESIGN CONCEPTS AND CONSIDERATIONS

Small-base leaders will normally be faced with two situations concerning ECPs. They will either be responsible for the design and construction of a new ECP or will be responsible for reviewing and assessing the design and functionality of an existing ECP and making improvements. Regardless, the following design concepts and considerations are applicable for small-bases that both strictly limit access and those that must allow some other form of access.

GENERAL CONCEPTS AND CONSIDERATIONS

The following general concepts and considerations are common for all small-base ECPs and should be incorporated into the design:

Small-Base Mission

The mission of the small-base will influence ECP design decisions. However, the design of the ECP should not detract from the mission and the operations conducted at the small-base. If the small-base mission strictly limits access to only US/coalition and HN military personnel and trusted vehicles then the ECP design will be much different than for a small-base that must allow access to local nationals (LN) or commercial delivery vehicles.

ECP Mission and Type of Access Control

The small-base leader must establish a mission for the ECP based on the type of access the ECP will control. The preferred type of access is one that limits all pedestrian and vehicle access to only mission-essential personnel and trusted vehicles. If the mission requires local national (LN) and civilian vehicle access, the ECP design will differ. Numerous factors should be considered when determining the type of access for a small-base, for example:

- ☐ Small-base mission and operations
- ☐ Threat
- ☐ Operations conducted on the small-base
- ☐ Mission of tenant units
- ☐ Number of ECP security personnel available to enforce access control
- ☐ Future changes to access control requirements, methods, and equipment

The type of access control maintained by the ECP will be the primary influence on the design. Consider the following:

- ☐ Will the ECP control vehicle access?
- ☐ Will the ECP control personnel access?
- ☐ Or will the ECP control access for both?
- ☐ Will the ECP limit access to only US/coalition personnel and trusted vehicles?
- ☐ Will the ECP allow access to LN personnel and vehicles?

The small-base leader must develop, establish, and maintain access control policies and procedures to safeguard the small-base and ensure mission accomplishment. *The Joint Forward Operating Base (JFOB) Protection Handbook* (GTA #90-01-011) provides specific guidance concerning access control procedures for personnel and vehicles.

Limit Number of ECPs

Limit the number of ECPs to minimize protection and manpower requirements. FOB designs should include primary and alternate ECPs. Alternate ECPs should not be continuously manned, but secured and opened only for emergency access or egress.

Specific Threats

The ECP should be designed to defeat specific threats. Design focus should be on both current and possible future threats. The ECP should be designed to remain functional regardless the level of threat. Consider the following:

- □ Has a FOB threat assessment been completed?
- □ What threats have been identified for the small-base?
- □ Have specific threats been identified for the ECP?

Site Selection/Terrain Constraints

Terrain constraints and site characteristics of the small-base influence ECP design. Depending on the circumstances, natural terrain features can be either beneficial or detrimental to ECP design and layout. Urban small-base sites typically have more design limitations than rural sites. Likewise, mountainous sites have more design challenges than sites located in open flat terrain. Small-base leaders should maximize opportunities to use natural terrain features as barriers and avoid locations that give the enemy the terrain advantage.

> **Preferred Method:** Flat terrain with a gentle rise in elevation up to the small-base ECP is generally preferred. This rise in elevation allows for clear observation of approaching vehicles and assists ECP personnel in assessing potential threats.

HN and Political Constraints

Design ECPs to have minimal impacts on HN activities. Once the small-base mission and protection requirements are met, then small-base leaders should strive to minimize local traffic disruption and land appropriation from LN. If any of the following issues are unacceptable then the ECP design should attempt to minimize their impact:

- □ What impact will the ECP have on local traffic?
- □ Will the ECP cause the LN to be inconvenienced?
- □ Will the ECP restrict movement of the LN?
- □ Will construction of the ECP require use of private land?

Higher Headquarters Regulations

All pertinent regulations and requirements should be reviewed and included in the small-base ECP design. The REFERENCES Section provides a listing of Graphical Training Aids (GTA), Training Circulars (TC), Center for Army Lessons Learned (CALL) Handbooks, Unified Facilities Criteria (UFC) and various other publications that provide guidance for the development of small-base ECPs.

Logistics Support and Equipment/Material Availability

Logistics support impacts ECP design and influences the availability of construction equipment and selection of materials. In austere environments with limited logistics support, design and technology solutions presented in this GUIDE might not be available. As a result, the ECP mission and access control measures may be limited and alternative measures should be considered.

Integration with Perimeter Security System

The ECP is an integral part of the small-base perimeter and must be designed to seamlessly integrate with and continue established perimeter security measures. ECP protection measures should mirror those of the perimeter.

Capacity

If the ECP mission requires control of vehicle access, then design the ECP to maximize the flow of authorized vehicle traffic and eliminate undue delays and congestion that could affect small-base operations and present possible targets for attack. The design should consider future expansion and the potential for increased volume of vehicles and personnel.

Available Space

The spatial requirements for an ECP will vary depending upon the ECP mission, type of access control, anticipated traffic volume and required security measures. The key design challenge is to maximize the distance between the ECP perimeter and surrounding developed areas with the goal of providing as much open space (clear zone) as possible. Small-base leaders must think three-dimensionally when considering ECP spatial requirements and design; the space above, below and to the sides of the proposed ECP must be considered.

Available Security Personnel

The number of security personnel available to operate the ECP will impact the mission of the ECP and the type of access control maintained and should be factored into the design.

Integration of HN Security Personnel

Some small-bases may be able to integrate HN security personnel into the operation of the ECP. If so, then the ECP design should consider how this will be accomplished and should ensure that the same level of protection afforded US/coalition personnel is provided to HN personnel.

Random Operational Measures

Design the ECP to accommodate random operational measures; i.e., incorporate the ability to change operational measures and relocate barriers, overwatch positions, search areas, etc. Similar to random antiterrorism measures (RAMs), random operational measures should reduce predictability of ECP operations and layout in order to confuse enemy surveillance attempts. Examples:

- ☐ Moving barriers/obstacles to vary traffic patterns
- ☐ Randomly changing security personnel shift times
- ☐ Changing operation times for ECPs
- ☐ Randomly changing access control procedures
- ☐ Changing vehicle and personnel search procedures on a random basis
- ☐ Relocating ECP overwatch positions
- ☐ Implementing random patrols

Available Technology

Incorporate technology solutions as a force multiplier and to enhance random operational measures. Space and power requirements for available technology should be included in the ECP design. Both primary and emergency sources of power should be configured into the design to ensure continuous operation of the ECP. Preferred technologies include: closed-circuit television (CCTV), intrusion detection systems (IDS), redundant communication equipment linked to the base defense operations center (BDOC), audible alarm system, vehicle and personnel search equipment, and fire-fighting equipment. Inoperable technology can be deceptively employed while waiting for maintenance to deceive the enemy and to prevent predictability of ECP operations. For more information see the TECHNOLOGY chapter.

ESSENTIAL CONCEPTS AND CONSIDERATIONS

The following essential concepts should be incorporated into each small-base ECP design. The application of essential concepts and considerations in the final design should be determined on a case-by-case basis and tailored for each specific small-base.

Maintain Defense-in-Depth

Incorporate a layered defense-in-depth concept into the design that integrates with and continues small-base perimeter security measures. Include pre-planned, mutually supporting hardened fighting positions for ECP security personnel. To maintain defense-in-depth, require potential aggressors to negotiate a series of varied and alternating barrier layers interspersed with varying distances of open ground and clear fields of fire.

Maximize Standoff

The best risk reduction technique is to keep the effects of an enemy attack as far away as possible. Design the ECP to maintain and maximize the standoff distances (Figure 2-5) established for the small-base perimeter. Increased standoff significantly reduces risk and provides ECP security personnel the space and time to detect, assess and respond to a threat. Maximum standoff may be difficult to achieve in an urban environment. In such cases, incorporate enhanced blast and ballistic construction and retrofit techniques to enhance standoff and provide depth; to include the use of nonlinear serpentine lanes, protective fighting positions for ECP security personnel, vehicle barriers, and overwatch positions. Allowances for standoff should permit opportunities to upgrade the ECP to meet future threats and changes to the ECP mission. *The JFOB Protection Handbook (GTA 90-01-011)* (Chapter 4) provides a detailed discussion of standoff.

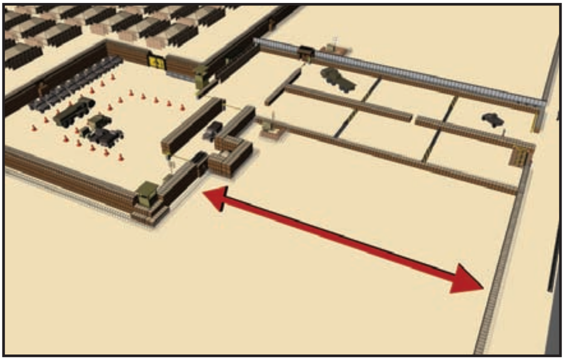


Figure 2-5. Maximize Standoff

Eliminate or Reduce Straight-Line Access from Local Entry/Access Roads

Eliminate or minimize perpendicular lines of approach and straight-line, uncontrolled vehicle access routes into the ECP from the surrounding road network (Figure 2-6). Redirect vehicle and civilian pedestrian routes away from the ECP. Techniques to slow vehicles and control access roads are discussed in the Speed Management Techniques section of the BARRIER chapter. Techniques to control local entry/access roads include the use of:

- ☐ Sharp 90 degree turns into the ECP from surrounding road network
- ☐ Construction of traffic circles leading into the ECP
- ☐ Vehicle barriers to block straight-line avenues of approach

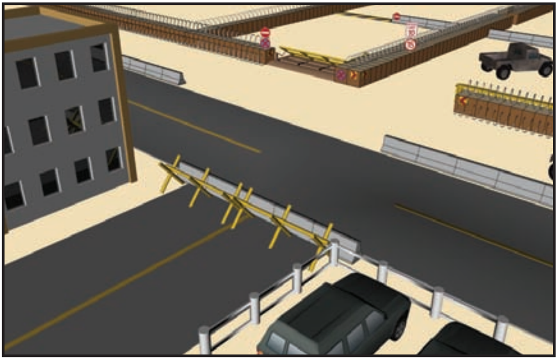


Figure 2-6. Vehicle Barriers used to Eliminate Straight-Line Access

Eliminate Natural or Man-made Enemy Vantage Points

Design the small-base ECP to prevent the enemy from observing ECP operations (Figure 2-7). ECPs should have a dedicated right-of-way that provides protection from building encroachment, tree overhang, and other natural or manmade objects that provide enemy vantage points. ECPs should not be constructed adjacent higher natural terrain or tall buildings that provide observation platforms. Design ECPs to use tall barriers and screening materials to limit or block an attack by direct-line-of-sight weapons. Screening materials should not block the view of ECP overwatch positions. Crew-served weapons and counter-sniper teams in these positions should be able to observe and cover the entire ECP. Although a challenge in urban environments, design considerations include:

- □ Construct the ECP on high ground
- □ Take advantage of natural or manmade obstructions, such as trees, walls or buildings that obscure enemy line-of-sight; use of obstructions must be weighed against the need to maintain clear zones around the ECP

- ☐ Employ screening materials in and around the ECP; screening materials should also be used during the construction phase to prevent surveillance

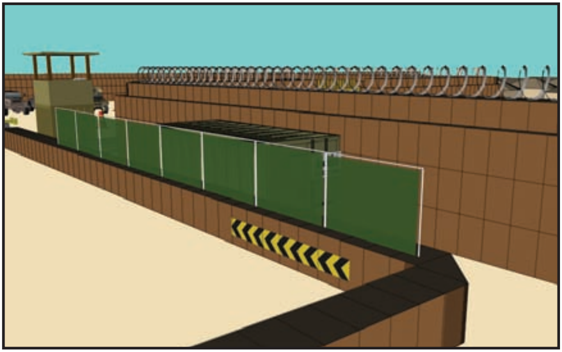


Figure 2-7. Obstruction Screen and Tall Barriers used to Eliminate Natural or Man-made Enemy Vantage Points

Eliminate Potential Enemy Hiding Places

Design the ECP to eliminate nearby hiding places (Figure 2-8). Create clear zones that allow an unobstructed view of the surrounding area. Eliminate vegetation, drainage channels, ditches, ridges, or culverts that might provide concealment. Restrict access to such areas by emplacing personnel barriers such as concertina or razor wire.

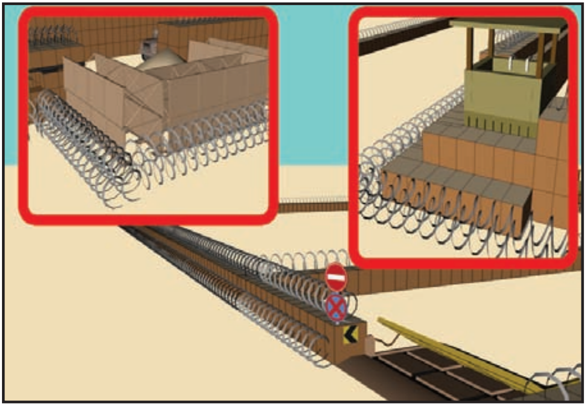


Figure 2-8. Concertina Wire used to Eliminate Potential Enemy Hiding Places

Incorporate Nonlinear, Serpentine Design with Speed Management Techniques

Design the ECP with a nonlinear, serpentine layout and vehicle barriers (Figure 2-9) to channelize, control vehicle speed and prevent unauthorized access. Extend the nonlinear design to a length that provides ECP security personnel adequate time to observe, assess, provide early warning and respond to inbound personnel/vehicles that pose a potential threat.
The diagram below (Figure 2-10) provides an example of the nonlinear, serpentine lane layout for use in ECPs. Recommended barrier spacing distances in relation to preferred speed reduction requirements are discussed in the Speed Management Techniques section of the BARRIERS chapter.

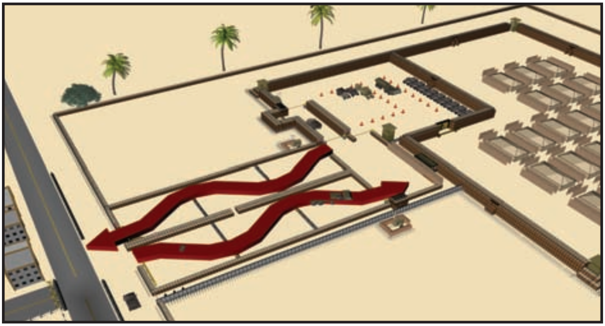


Figure 2-9. Nonlinear, Serpentine Design

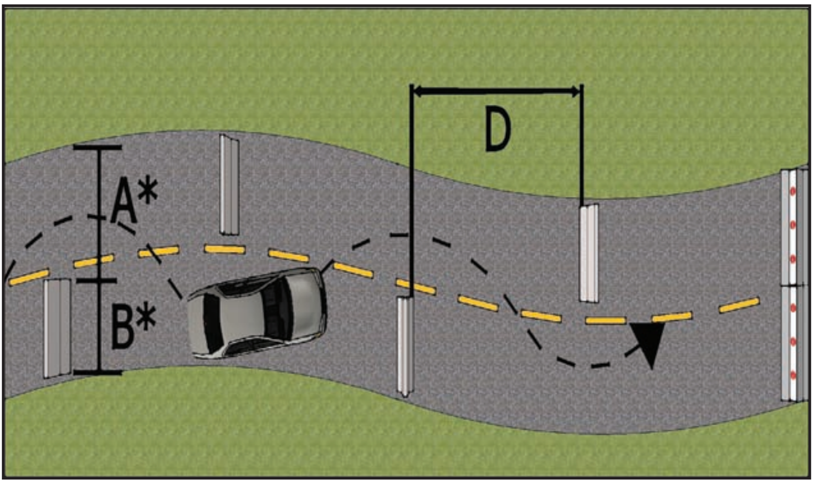


Figure 2-10. Example of Nonlinear, Serpentine Lane Layout
A* -- 12 Feet Maximum; B* -- Varies Depending on Road Width
D -- Separation Distance for Barriers
(UFC 4-022-02)

Effective speed management and reduction techniques are constructed with vehicle barriers and include: “S” curves, serpentine lanes, sharp 90 degree turns, and speed bumps and tables. The tighter the serpentine lanes or “S” curves the more the vehicle must slow down to negotiate the lane. The most effective design is one that uses a combination of the above techniques. However, a combination of techniques will normally require a larger footprint/space for the ECP. Considerations for designing a serpentine include:

- □ Perceived threat vehicle(s)
- □ Desired vehicle speed
- □ Authorized vehicle access requirements
- □ Maximum road width required for authorized vehicles
- □ Method for providing rejection or turn-around area

Install Movable Vehicle Barriers at ECP Entrances

Vehicle barriers at entrances (Figure 2-11) should be capable of being quickly moved to allow authorized vehicle access. Removable bollards, portable vehicle barriers, cable-reinforced crash beam barriers, and crash gate systems are all viable options. Heavy vehicles in all sizes and configurations can be employed as expedient barriers. Large, construction-type and armored vehicles (including damaged and captured enemy vehicles) are effective ECP entrance barriers or as expedient barriers for the serpentine lanes.

Crash beam gates or cabled gates can be used if the ECP entrance is designed so that approaching vehicles must slow to 10 mph or less to enter; this can be accomplished by designing a sharp 90 degree turn into the ECP from the external roadway. Barrier walls at the entrance to the ECP should be capable of stopping a 30 mph vehicle attack.

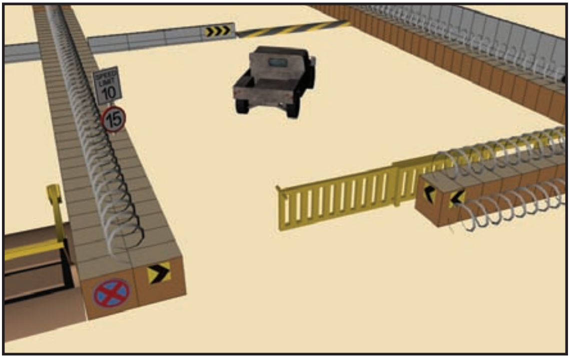


Figure 2-11. Movable Vehicle Barriers at ECP Entrance

Ensure Entrance/Exit Points Maintain Access Control

Design entrance/exit points (Figure 2-12) to eliminate high-speed approaches as a method of forced entry and to deny unauthorized entry through exit lanes. The objective should be to ensure that attackers cannot enter the ECP by going against the flow of exiting vehicle traffic. Construct entry and exits to prevent ramming-vehicle attacks. Maintain positive control over exit lanes with an active barrier. Additional vehicle barriers should be installed behind the gates for defense in depth against such attacks. Use both passive and active (if available) vehicle barriers and traffic control devices such as tire shredders, speed bumps/tables, and drop-arm crash barriers. Exit lanes should be constructed using vehicle barriers in a nonlinear serpentine layout (tight “S” curves and/or 90 degree turns) and with speed management techniques.

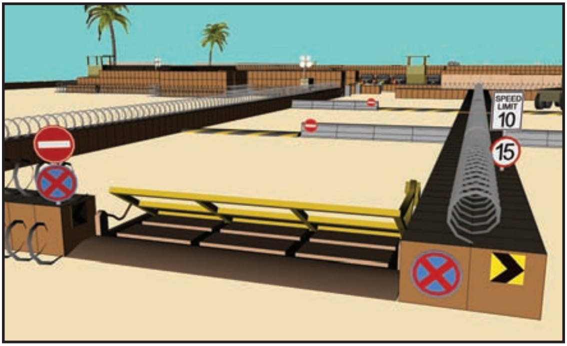


Figure 2-12. Barrier at Exit Point Maintains Access Control

Construct Vehicle Barriers Throughout the ECP

Vehicle barriers should be used to form the ECP walls and nonlinear serpentine lanes (Figure 2-13) throughout the ECP and to control the speed of vehicles to 10 mph or less. For the ECP barrier walls and serpentine approach, use soil-filled containers, cabled jersey barriers, cabled concrete blocks, bollards or heavy vehicles. Choose barriers based on their ability to stop or defeat an identified threat. Installed barriers should be continuous and anchored together for maximum blast-mitigation and counter-mobility.

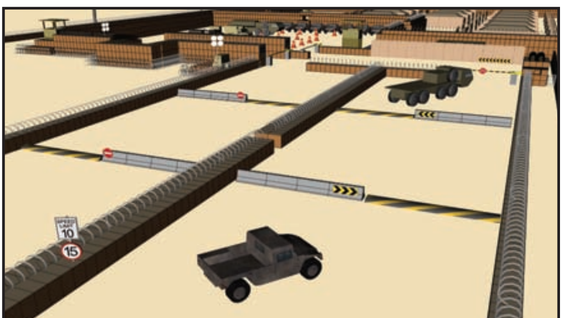


Figure 2-13. Use Vehicle Barriers Throughout ECP

Maximize Protection for ECP Personnel (Hardened Fighting Positions)

A key challenge when designing a small-base ECP is to minimize the risk to ECP security personnel and maximize the level of protection. Incorporate both primary and alternate hardened fighting positions/guardhouses (Figure 2-14) with overhead cover throughout the ECP to provide protection from dedicated assaults, sniper attacks, VBIED/PBIED blasts, fragments and debris. Design protective structures with adequate space for personnel, ECP equipment, weapons, and ammunition.

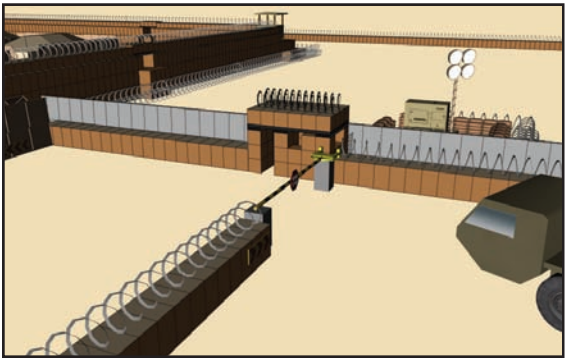


Figure 2-14. Hardened Fighting Position for ECP Security Personnel

Contain, Segregate and Channelize Vehicle and Pedestrian Traffic

Design the ECP to fully contain and control entering vehicles and pedestrians. Segregate and channelize vehicle and pedestrian traffic (Figure 2-15) into separate access control lanes. Similarly, segregate commercial delivery trucks and passenger vehicles; if both vehicle types use the same lanes the effectiveness of speed management techniques is diminished, since distances between barriers must be increased and lanes widened to allow larger vehicle movement. Containment and segregation is accomplished with a combination of passive, active, and natural barriers.

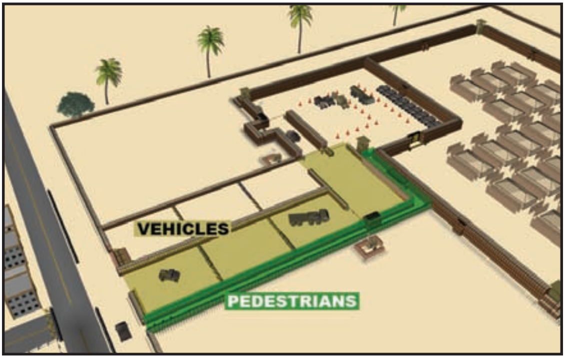


Figure 2-15. Segregate and Channelize Vehicle and Pedestrian Traffic

Construct ECP Lanes to Accommodate Oversized Vehicles

If oversized vehicle traffic is anticipated (military/ commercial delivery trucks), the ECP design will require modifications to lane widths, size of inspection areas, and spacing of barriers (Figure 2-16). If wider lanes are incorporated into the design then additional speed management techniques and vehicle barriers must be used to prevent smaller passenger vehicles from gaining unauthorized access through the expanded lanes. The minimum lane width to accommodate passenger and smaller military vehicles should be 10 ft. (3.0 m). The preferred lane width is 12 ft. (3.6 m). However, the overall lane width will expand when vehicle barriers are added to create a serpentine layout. Proper lane widths are determined by calculating the widths of anticipated vehicles, barrier dimensions, and desired speeds (see Speed Management Techniques section of the BARRIERS chapter).

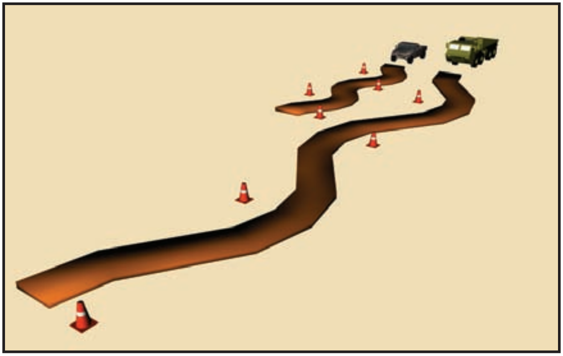


Figure 2-16. Construct Wider/Larger Lanes to Accommodate Oversized Vehicles

Maximize Vehicle Access Control

If vehicles are allowed to enter and exit the small-base then access must be controlled with simple features and clear instructions on signs, employment of vehicle barriers, adequate turning dimensions, and base-specific guidance detailing vehicle access control and search procedures. Specific considerations for vehicle access control include:

- □ Vehicle/driver/passenger search requirements and procedures
- □ Methods of searching
- □ Equipment requirements

The JFOB Protection Handbook (GTA #90-01-011) provides specific guidance concerning vehicle access control measures and search procedures.

Maximize Pedestrian Access Control

If pedestrians are allowed small-base access, the ECP design should direct foot traffic to a specified walkway that is separated from vehicle traffic (Figure 2-17). Separation of vehicles and pedestrians mitigates the effects of VBIED or PBIED attack. Maintain a minimum width of 4 ft (1.2 m) for pedestrian walkways. Pedestrian walkways should be designed with limited obstructions to ensure security personnel maintain continuous visual contact with approaching pedestrians. In addition, establish base-specific guidance detailing personnel access control measures and search procedures. *The JFOB Protection Handbook* (GTA #90-01-011) provides specific guidance concerning personnel access control measures.

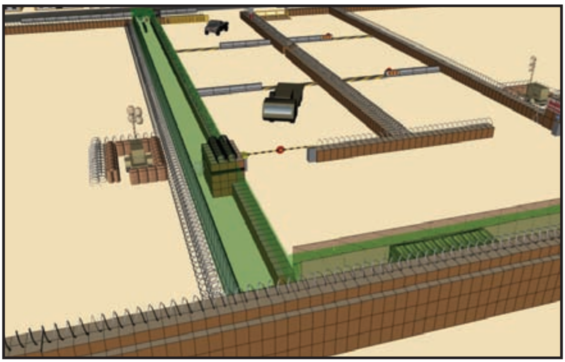


Figure 2-17. Example of Pedestrian Access Control

Construct Vehicle Turn Around and Rejection Areas

Design the ECP with adequate space for unauthorized vehicles to turn around with minimal impact on traffic flow (Figure 2-18). Design the approach roadway with the required turning radius to allow a single, continuous vehicle movement. The following are recommended, minimum, inside turn around radii:

- Locations serving only passenger vehicles: 15 to 30 ft. (4.57 to 9.14 m); preferred width is 20 ft (6.1 m)

- Corners for larger vehicles: 35 ft. (10.67 m)

- Intersections for large trucks (WB-50), including semi-trailers (WB-67) turn: 150 ft. (5.24 m)

- Turnaround areas for large trucks: 65 ft. (19.81 m)

The JFOB Protection Handbook (GTA #90-01-011) provides specific guidance concerning the radius of turns and lane widths.

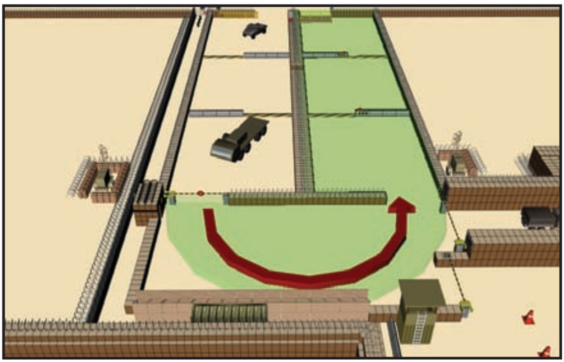


Figure 2-18. Vehicle Turn Around and Rejection Area

Construct Parking/Transfer Yard for Authorized Vehicles

If the small-base allows only mission-essential/trusted vehicle access, consider a parking/transfer yard for these vehicles (Figure 2-19). Preventing vehicles from entering the interior of the base allows positive vehicle control while keeping the potential threat of VBIEDs outside the interior of the small-base. An alternative is to allow vehicle mounted crew-served weapons and select mission-essential/trusted vehicles access to the interior of the small-base to be used, if needed, to repel an attack.

Provide adequate space for the expected number of vehicles. The design should allow for the entire area to be continuously monitored and kept under observation by security personnel and covered by fires from guard towers/overwatch positions. Provide protection for personnel exiting from vehicles and entering the small-base interior. Personnel protection measures include taller barriers for perimeter walls surrounding the vehicle parking/transfer yard and screening materials. Use obscuration and screening materials to prevent enemy observation of the vehicle parking/transfer yard and security operations.

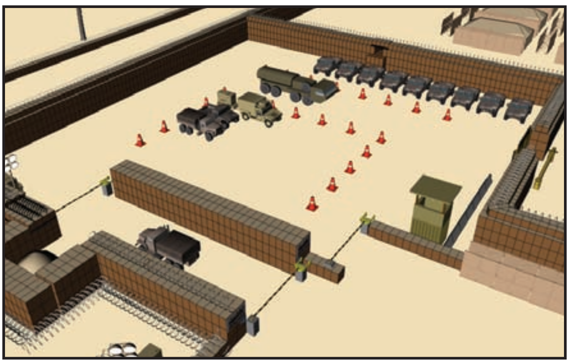


Figure 2-19. Parking/Transfer Yard for Authorized Vehicles

Build Exclusive and Separate Inspection/Search Areas

If required by the type of access control, design separate vehicle and pedestrian search areas (Figure 2-20) with the capability to search all entering vehicles and pedestrians for IEDs, weapons, and contraband. Separate search areas for vehicles and pedestrians will help avoid congestion and improve efficiency of searches during 100% inspections. Pedestrian search areas should be separate and offset from traffic lanes. Larger vehicle (truck/commercial) search areas should be separated from passenger vehicle search areas because requirements for these vehicles differ significantly. In addition, separate search areas should be designed to conduct female and male searches. Establish base-specific policies that detail search requirements and procedures.

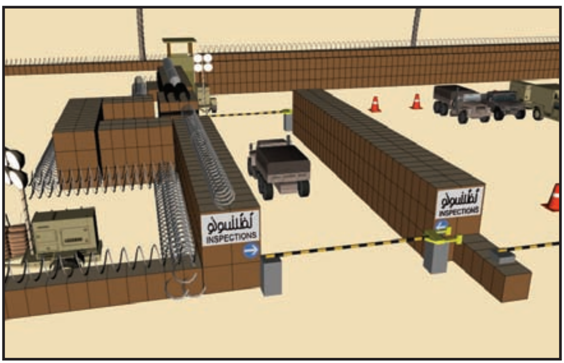


Figure 2-20. Separate Inspection/Search Areas for Vehicles

Vehicle Search Area - Concepts include:

- **Separate search areas.** Vehicle search areas should be a separate and distinct area of the ECP that is offset from traffic lanes and at an acceptable standoff distance.

- ☐ **Segregate vehicle types.** Segregate larger vehicle (truck/commercial) traffic from passenger vehicles and construct search areas for each.

- ☐ **Adequate staging space.** Provide adequate space to stack and stage waiting vehicles (distance from Approach Zone to Access Control Zone). Prevent staged personnel from observing search procedures.

- ☐ **Blast mitigation measures.** Include blast mitigation measures (berms, soil-filled bins/walls, soil-backed concrete barriers) in vehicle search areas to protect personnel from VBIED effects.

- ☐ **Adequate size to accommodate anticipated vehicle types.** To facilitate safe inspections, design vehicle search areas that are a minimum width of 18 ft. (5.5 m) and a minimum length of 40 ft. (12.2 m). Expand this length if oversized vehicles are expected. Design search areas that can be closed to protect inspection equipment during inclement weather. Provide the following dimensions for inspection areas:

  - For standard passenger vehicles: 15 x 25 ft. (4.5 x 7.2 m) inspection bays

  - For commercial/oversized vehicles: 18 x 80 ft. (5.5 x 24.4 m) wide by 17 ft.-6 in. (5.4 m) high inspection bays

- ☐ **Driver/passenger holding area.** Design holding areas that prevent drivers/passengers from observing search operations. Holding areas should not protect drivers and passengers from explosive effects. Drivers and passengers should be searched and kept under constant observation by armed personnel not involved in search procedures.

- ☐ **Screen search areas from external surveillance.** Obstruct observation of the search area from outside the small-base with berms, tall barriers, camouflage netting, or other screening material.

□ **Military Working Dog (MWD) rest area.** Extreme heat and sun cause fatigue and reduce MWD effectiveness. To extend effectiveness, keep animals not actively engaged in searching vehicles in air-conditioned tents or containers. Other measures to improve dog endurance include cold collars, cooling-mist fans and dog shoes.

□ **Shade.** Provide overhead shade for search areas to maximize ECP personnel and MWD effectiveness.

□ **Ramps/search pit.** Consider vehicle ramps and a mechanic's (search) pit that allow searchers an effective means to visually inspect vehicle undercarriages. Absent technology, this is the only way to thoroughly search a vehicle's underside.

□ **Cargo truck search.** Consider using an automated vehicle inspection system such as the Military Mobile Vehicle and Cargo Inspection System (MMVACIS) to reduce security force exposure inherent to manual searches.

□ **Mirrors.** Use mirrors to detect poorly or hastily concealed explosives placed near outer vehicle edges. The mere act of searching beneath a vehicle is often a psychological deterrent to terrorists.

□ **Floor.** If no search pit is available, search area floors should be flat and hard to allow searchers to crawl under vehicles with a mechanic's creeper. Suitable surfaces include asphalt, concrete, AM2 matting, and plywood. Astroturf or similar matting placed over the floor protects MWDs' feet from ground heat.

□ **Illumination.** Search pits should be well illuminated to allow searchers to see all portions of the vehicle. Lighted ramps and mechanic's pits facilitate detailed underbody searches. Flashlights or extension lamps should also be available to ECP security personnel.

- ☐ **Closed Circuit Television (CCTV) systems.** CCTV can record vehicles for observation and later review. Position cameras to prevent vehicle or perimeter lights from blinding the camera. Cameras placed outside should be protected from the environment.

- ☐ **Electronic explosive detection devices.** Commercially available explosive detection devices that utilize chemical indicator, backscatter or transmission imaging can augment manual visual search explosive detection capabilities. The TECHNOLOGY chapter provides equipment that may be available for this purpose.

- ☐ **Power requirements.** Electronic equipment such as active barriers, detection devices, CCTV, lighting, and communication systems require power. Develop a design that provides power for planned and future electronic devices. Incorporate a reliable alternate power source such as a standby generator to ensure continuous ECP operations.

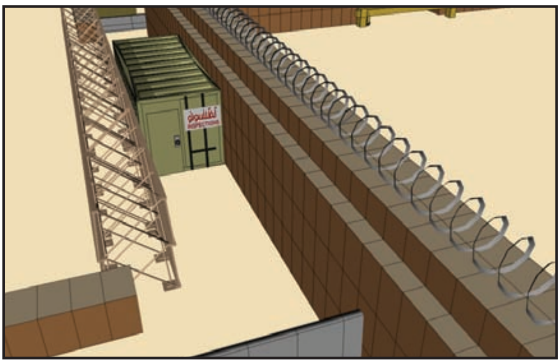


Figure 2-21. Container used as Separate Pedestrian Search Area

Pedestrian Search Area - Design considerations are similar to those of vehicle search areas; however, the following pedestrian-specific issues should be considered:

- ☐ **Separate male and female search areas.** Design separate search areas for female and male searches.

- ☐ **Adequate staging space.** Design adequate space to stack pedestrians awaiting search (distance from Approach Zone to Access Control Zone). Prevent pedestrians waiting to be searched from observing search operations. Keep pedestrians under constant observation by armed personnel not involved in search procedures. If available, employ CCTV to assess pedestrian activities as they proceed through the ECP.

- ☐ **Blast mitigation measures.** Include blast mitigation measures such as soil-filled bins/walls, modular protective system (MPS) and shipping containers to protect pedestrians from PBIED/VBIED detonations.

- ☐ **Screen search areas from external surveillance.** Employ screening measures to prevent observation of search area from personnel outside the small-base.

- ☐ **Electronic explosive detection devices**. Consider commercially available explosive detection devices for the pedestrian search area.

Construct Hardened Overwatch Positions

Overwatch positions are critical to defense-in-depth. The ECP overwatch (Figure 2-22) should provide observation and coverage of the entire ECP with crew-served weapons that can employ deadly force to stop vehicles and repel attackers attempting to bypass, ram, or run through an ECP. Design alternate overwatch positions as a random operational measure. Design hardened overwatch positions with the same considerations as

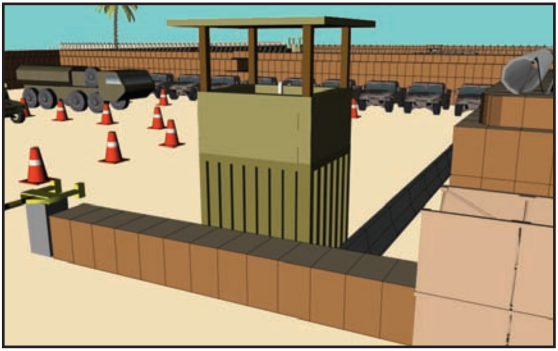


Figure 2-22. Hardened Overwatch Position

those used against an ambush - fix the enemy in place so they can be neutralized.

- ☐ Establish an overwatch kill zone to engage hostile vehicles
- ☐ Install barriers to maximize a hostile vehicles time in the kill zone
- ☐ Position the overwatch to provide effective engagement of targets in the kill zone

Equip overwatch positions with weapons that can disable a vehicle or kill the driver. Preferred weapons are no smaller than a medium machine gun (M60 or M240G). Heavy guns (M2 .50-caliber machine gun or MK19 40-mm grenade launcher) are better at stopping a vehicle.

Once the kill zone is established, evaluate weapons system ranges to determine the risk to friendly guard posts, HN buildings, and personnel likely to be in the field of fire (range fan). All overwatch positions should have range cards that denote the weapon system's principal direction of fire (PDF), distances to key terrain features, and the final protective line (FPL). Range cards will enhance the gunner's ability engage a target, determine ranges, and estimate ranges to other targets. Some weapon systems have a required minimum range to activate the round. The kill zone for the overwatch position must be beyond that minimum range. Weapon systems selected for overwatch positions should require minimal traverse and elevation (T&E) adjustments to continually fire on the kill zone. Employ large, strong firing stakes if a T&E device is not available to define fields of fire during periods of darkness or low visibility. Finally, rules of engagement (ROE) should be well defined and readily available. ROE should be considered when selecting an overwatch position location. Consider the following when selecting overwatch positions (Figure 2-23):

- ☐ Can the overwatch clearly observe the entire ECP and its barriers?
- ☐ Is the overwatch able to clearly determine the circumstances under which they are authorized to employ deadly force?
- ☐ Does the overwatch allow adequate distance to engage target vehicles?
- ☐ Is the overwatch able to engage a hostile vehicle at least 100 meters away?
- ☐ What is the effective causality radius (ECR) of ammunition used in the overwatch weapon system?
- ☐ What are the maximum and minimum ranges of overwatch ammunition?
- ☐ Are friendly troops (to include HN troops and civilians) located within the field of fire (range fan) of the weapon system?
- ☐ Will ricochet rounds endanger friendly forces?
- ☐ Can the overwatch weapon systems engage enemy targets for 10 – 15 seconds?
- ☐ Can the weapons bring enfilade fire on hostile vehicles?

Figure 2-23. Overwatch Selection Considerations

Construct Hardened Perimeter Gate (Final Denial Barrier)

The final ECP design element is a hardened perimeter gate or final denial barrier (Figure 2-24) that is capable of preventing a ramming vehicle or VBIED from penetrating the small-base perimeter. This can be accomplished with active or movable vehicle barriers or military vehicles. The final denial barrier should provide a level of protection equivalent to that of adjacent ECP and perimeter barriers. Final denial barriers may include cabled crash-beam, drop-arm barriers, hydraulic pop-up barriers and metal crash gates. At a minimum, reinforce fence gates with cables that increase resistance to penetrating vehicles. Gates should be capable of denying access to both vehicles and personnel.

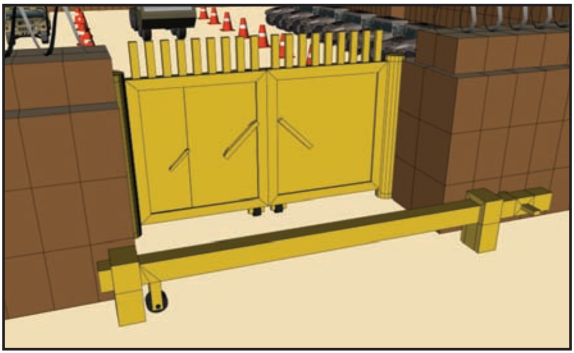


Figure 2-24. Example of a Final Denial Barrier

Provide Space for Off-site Parking Lots

Consider and identify off-site parking lot requirements (Figure 2-25). Off-site parking discourages unauthorized vehicles from requesting access. Direct personnel not requiring small-base access to this area; this limits traffic to mission-essential/trusted vehicles. Locate parking areas away from critical assets, inhabited areas, and ECP security personnel to maintain adequate standoff and minimize VBIED blast effects. Keep parking areas under constant observation by security personnel and regularly search for signs of unauthorized activity.

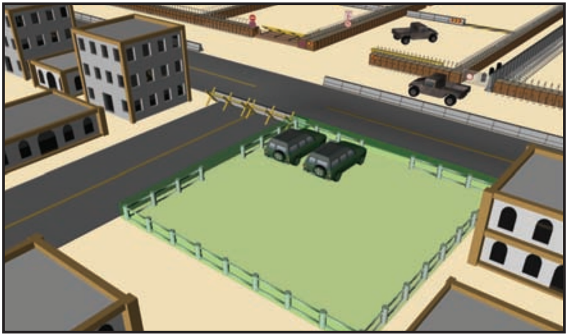


Figure 2-25. Example of Off-site Parking Lot

Consider an Exterior Logistics Transfer Point or “Cool Down” Area for Delivery Vehicles

If the access control for the ECP is strictly limited to only mission-essential personnel/trusted vehicles and prohibits access for delivery vehicles then a logistics transfer point should be considered (Figure 2-26). A logistics transfer point is a protected area outside the small-base perimeter designed to screen and transfer logistics supplies. The preferred location for the logistics transfer point is adjacent the ECP so that it can be controlled by ECP security personnel. If a logistics transfer point is constructed, positive control of delivery vehicles and the operator/passenger(s) is essential. One technique is to establish a “24-hour cool down” period that requires vehicles to remain parked and under observation for at least 24 hours before off-load is allowed.

Figure 2-26. Exterior Logistics Transfer Point

Install Security Lighting

The use of ECP security lighting is threat-dependent (Figure 2-27). At night, the commander may opt for light discipline to limit the profile of the base. However, if the ECP mission requires night operations then the design should include multiple, redundant lighting systems. Redundant lighting and power to support these systems prevents degraded lighting and ensures uninterrupted ECP operations. The design and layout should include multiple, redundant lighting fixtures to ensure that the loss of a single light does not seriously degrade the total lighting available for ECP security personnel. The use of lighting should be weighed against the need to minimize the illumination of ECP operations; in this case, on demand lighting should be considered. Lighting should provide enough intensity so that vehicles, pedestrians, security personnel, signage, and other hazards are visible. Lighting should not be directed in driver's eyes and should not backlight security personnel.

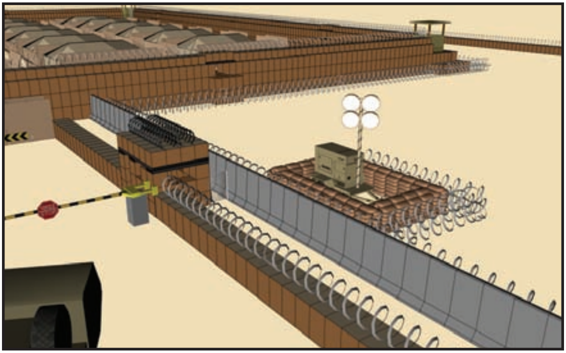


Figure 2-27. Security Lighting

Install Signage

ECP signs should be clear, concise, easily read, and displayed in the local language (Figure 2-28). Signs should stipulate access control requirements and provide specific instructions for vehicles and pedestrians, including the route to follow through the ECP and noncompliance warnings.

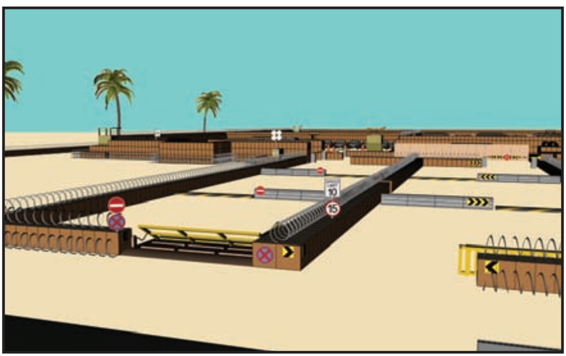


Figure 2-28. ECP Signage should be in Local Language and Easily Readable

CONSTRUCTION SEQUENCE

There is no standard sequence for constructing a small-base ECP. The method or sequence of steps for constructing an ECP will be site dependent and driven by many of the design considerations previously discussed. The following generic sequence of steps should be adapted for each site. Many of the steps should be conducted simultaneously in order to maximize protection as soon as possible. As a general rule, ECP construction should begin adjacent the small-base perimeter and continue outward until the ECP is completed. The TOOLS chapter provides an ECP Construction Sequence Checklist for use in supervising the construction process.

ECP Construction Sequence

- ◻ Post security and prepare hasty fighting positions
- ◻ Position crew-served weapons systems as hasty overwatch for the ECP and construct overwatch towers; ensure overwatch positions have interlocking fields of fire and can provide cover and observation of the entire ECP
- ◻ Clear fields of fire around the ECP
- ◻ Establish initial entry/access control measures for use while the ECP is being constructed
- ◻ Install signage that provides simple and clear instructions for access through the ECP
- ◻ Use vehicle barriers or other field-expedient methods to block high-speed avenues of approach into the ECP. Eliminate or reduce straight-line access from local entry/access roads.

- ☐ Use vehicle barriers to form the nonlinear serpentine lanes through the ECP and to create the perimeter walls of the ECP to contain, segregate and channelize vehicle and pedestrian traffic:

    - Ensure lanes are wide enough to accommodate oversize vehicles

    - Ensure vehicle turn-around and rejection areas are included in the layout

    - Ensure exit lanes, if needed, maintain same level of security and required access control measures

    - Seamlessly connect ECP barrier walls into the perimeter security/ wall system

    - Construct a parking/transfer yard for authorized vehicles; ensure space is large enough to conduct vehicle searches, if needed

    - If needed, form a vehicle search area; ensure a separate area is constructed to segregate the drive/passengers so they cannot observe search procedures

    - If required, construct a pedestrian search area; ensure a separate area is constructed to segregate pedestrians from those being searched so they cannot observe search procedures

    - Install personnel barriers around/on vehicle barriers to prevent unauthorized personnel from attempting to climb or gain access over the walls of the ECP

    - Ensure the layout eliminates potential enemy hiding places

- ☐ Install movable vehicle barriers at the entrance to the ECP

- ☐ Ensure ECP personnel are protected to the maximum extent possible by constructing hardened fighting positions. Construct both primary and alternate positions. Ensure overhead protection is included to protect against artillery or mortar fire.

- ☐ Construct a final denial barrier/hardened perimeter gate at the entrance to the small-base
- ☐ After establishing the nonlinear serpentine lanes and walls of the ECP, install vehicle barriers through the lanes as vehicle speed management techniques
- ☐ Install screening/obscuration material to block surveillance/ observation of ECP operations
- ☐ Eliminate natural or man-made enemy vantage points
- ☐ Install power requirements
- ☐ Install security lighting
- ☐ Install additional technology solutions (i.e., vehicle and personnel screening equipment)
- ☐ Construct an external parking lot for unauthorized vehicles
- ☐ Add additional signage, if needed
- ☐ Update the entry/access control measures
- ☐ If needed, update vehicle and pedestrian search procedures
- ☐ Train/rehearse ECP personnel on access control measures and response/escalation of force/ROE procedures
- ☐ Continue to improve and structurally harden the ECP

CHAPTER 3
ECP BARRIER CONCEPTS

Barriers are vital for small-base protection and essential to an effective ECP. Barriers maintain standoff distances, establish boundaries, limit and control access of personnel and vehicles, channelize movement, and obstruct line-of-sight observation from outside the perimeter. Barriers can be natural, man-made, or a combination of both. Natural barriers are terrain features, such as mountains, cliffs, rivers, canals, waterways, and swamps. Man-made barriers include berms and ditches, personnel and vehicle barriers, gates, and expedient barriers such as military vehicles, construction equipment, and rubble.

Barriers establish a continuous physical impediment that:

- Defines the small-base and ECP perimeter
- Establishes a physical and psychological deterrent to individuals attempting unauthorized entry
- Optimizes use of security forces
- Enhance detection/apprehension opportunities

SPEED MANAGEMENT TECHNIQUES

A moving vehicle must have a certain level of kinetic energy to penetrate barriers and inflict damage. Kinetic energy depends on an object's mass and speed. Since an approaching vehicle's mass remains essentially constant, kinetic energy increases with higher speed. In fact, a vehicle traveling at 20mph has four times the kinetic energy of one traveling at 10mph. A vehicle's impact speed will depend on its mechanical performance and the distance traveled before impact. Approach angle also influences vehicle speed. Impact speed can be limited with forced cornering and off-angle approaches.

Possible attack routes and angles should be analyzed for the small-base and each ECP. When designing the ECP, prepare a site sketch of the surrounding topography, buildings, and streets (Figure 3-1) to identify long, straight, level avenues of approach and possible attack routes. Do not limit potential attack routes to only established or improved roadways. Any surface suitable for vehicular traffic (street, parking lot, lawn, or sidewalk) can be used for an attack. Potential attack paths are at least as wide as the attack vehicle, approximately 8 ft. (2.4 m) and wider for large trucks, and have a radius of curvature of more than 22.5 ft. (6.8 m). Steep grades also affect vehicle speeds. Uphill grades reduce approach/impact speed while downhill grades increase it.

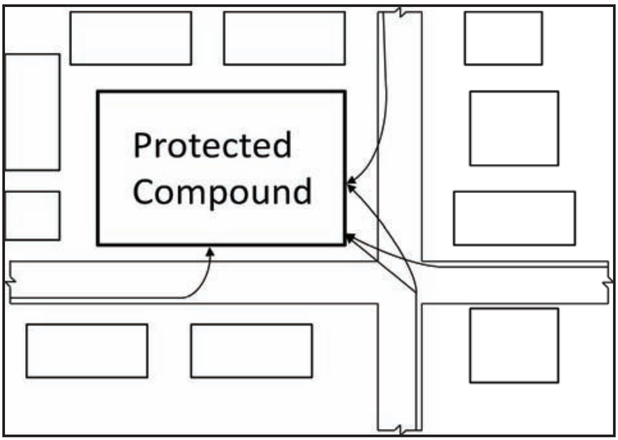


Figure 3-1. Site Sketch with Possible Vehicle Attack Scenarios

Utilize the small-base layout, surrounding roads, buildings, terrain, barriers and ECP design concepts to eliminate straight-line access routes and reduce vehicle speeds.

Speed management techniques include:

- □ Sharp 90 degree turns into the ECP that force vehicles to slow to 10 mph or less
- □ Traffic circles leading into the ECP
- □ Vehicle barriers to block straight-line avenues of approach
- □ Speed bumps and speed tables
- □ Nonlinear, serpentine traffic lanes

The nonlinear, serpentine layout of traffic lanes is a simple, effective technique. The "S" layout constructed with vehicle barriers significantly reduces approaching vehicle speeds. Figure 3-2 provides an example of a serpentine layout using concrete vehicle barriers.

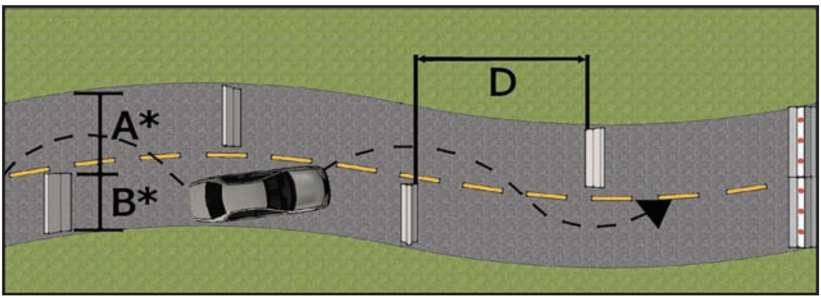


Figure 3-2. Traffic Lane with Nonlinear, Serpentine Layout
A* — 12 Feet Maximum; B* — Varies Depending on Road Width (UFC 4-022-02)
D -- Separation Distance for Barriers

Tightening serpentine curves and shortening the distance between barriers additionally reduces vehicle speeds. For example, a road with a 30 ft. (9.3m) width would require 20-ft (6.1 m) vehicle barrier spacing to reduce vehicle speeds to 10mph. Figure 3-3 provides barrier separation distances and accompanying maximum vehicle speeds. Figure 3-3 should be used in conjunction with Figure 3-2. If commercial/delivery trucks are included in the same traffic lanes with passenger vehicles then distances between barriers must be increased and lanes widened to allow larger vehicle movement; wider lanes and greater distances between barriers reduces the ability to control the speed of passenger vehicles. Optimize serpentine layouts by designing separate passenger vehicle and truck traffic lanes.

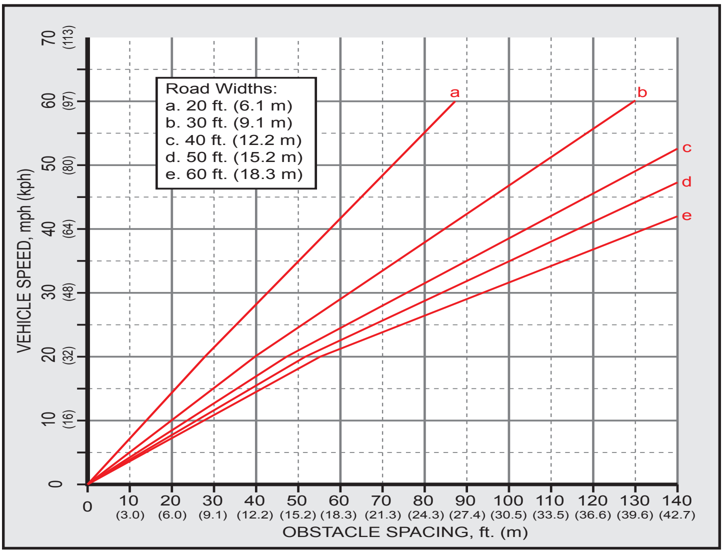


Figure 3-3. Separation Distance (D)* for Barriers to Reduce Speed of Passenger Vehicles on a Straight Path (UFC -4-022-02)

BARRIER CLASSIFICATIONS

Barriers are categorized as either active (containing moving parts) or passive (non-moving parts). Barriers are further characterized as fixed (permanently installed) or portable (moveable: may require heavy equipment). Many barrier types exist; barriers should be selected based on their specific intended applications.

Active Barriers. Active barriers are electronically or manually operated. Examples include barricades, retractable bollards, beams, and gates. From a safety standpoint, active vehicle barriers are capable of causing serious injury or death, even when properly operated. Most injuries result from equipment malfunction, inadvertent activation, or operator error. If employing active barriers, alert incoming vehicles of their presence with warning signs and lights. Active barriers should include backup power, emergency cutoff switches, and adequate lighting.

Passive Barriers. Passive barriers contain no moving parts and are designed to absorb energy upon impact, and transfer that energy to the foundation. Examples include portable or permanent concrete structures, concrete bollards, posts, guardrails, ditches, and reinforced fences. Passive barriers used in an ECP should be designed to allow little or no penetration, especially if available standoff distance is limited. Passive barriers are commonly found in expeditionary environments and limited duration operations.

Fixed Barriers. Fixed barriers are permanently installed and usually require heavy equipment to move or dismantle. Examples include hydraulically-operated rotation or retracting systems, pits, and concrete or steel barriers. Fixed barrier systems can be active or passive.

Portable Barriers. Portable barrier systems are relocatable, although heavy equipment may be required for relocation. Examples include hydraulically operated, sled-type barricades, jersey barriers, and filled 55-gallon drums. Portable barrier systems can be active or passive.

ECP BARRIER SELECTION

ECP planners should determine the number and types of barriers needed. Additional considerations include employment locations, barrier pre-positioning (if applicable), barrier purpose (traffic control, perimeter security, etc.), and resources necessary for barrier relocation (anchors, cables, forklift, trailer, etc.). The following actions guide barrier selection:

- □ **Determine the threat.** Past history of threat tactics will influence the number, type, and size of barriers required for the ECP. A detailed, ECP-specific threat assessment provides likely threat scenarios.

- □ **Determine required standoff distances.** Standoff distances for the ECP are determined by the threat levels and availability of land. If required standoff is not available or achievable, evaluate alternative means to mitigate threat (for example, harden ECP fighting positions or build a blast wall); decide to accept additional risk; or restrict use of ECP at higher threat levels.

- □ **Select perimeter barriers**. ECP perimeter barriers define and maintain standoff zone boundaries. Barrier selection is different for each tactic (stationary or moving vehicle bomb, RPG, sniper, etc.) and should be based on current threat assessments.

- □ **Identify access control requirements.** Barriers should be selected to support access control measures. ECP barrier requirements should be consistent and integrated into the perimeter barrier system and designed to restrict vehicle and personnel access into the small-base.

- □ **Develop standard operating procedures (SOP).** SOPs should explain how active barriers are employed, operated, control access, and outline specific rules of engagement (ROE). ROE should address activating barriers against high-speed, threatening vehicles. Security personnel should be alert, well trained, show good judgment, and fully understand current threat, SOP, and ROE.

Additional information and specific guidance can be found in Joint Publication 3-15, *Barriers, Obstacles, and Mine Warfare for Joint Operations; MIL-HDBK-1013/10, Military Handbook Design Guidelines for Security Fencing, Gates, and Guard Facilities; and UFC 4-022-02, Selection and Application of Vehicle Barriers.*

ECP Barrier Selection Considerations

In selecting barrier materials, small-base leaders should consider the following:

- ☐ What is the purpose for the barrier? To control personnel or vehicle access?
- ☐ If vehicle, what is the counter-mobility capability of the barrier?
- ☐ Does the barrier have blast-mitigation capability?
- ☐ If a blast occurs, will the barrier create secondary fragmentation?
- ☐ Can the barrier be easily moved to accommodate ECP changes (operational, capacity, threat)?
- ☐ Is material handling equipment (MHE) available to place and move barriers?
- ☐ Can the barrier be anchored together?
- ☐ Can the barrier accommodate additional security measures (concertina top-guard, intrusion detection system, lighting, etc.)?
- ☐ Can barriers be placed to maximize standoff distance?
- ☐ Can barriers be combined with each other, the natural terrain, or man-made obstructions? [Barrier combinations and layers are more

effective than single barriers; barrier combinations must afford an equal degree of continuous protection.]

- ☐ Can barrier placement be far enough away from other structures--trees, telephone poles, antenna masts—to prevent them from being used to circumvent the barrier?

- ☐ Can barrier placement prevent vehicles from parking nearby? [Vehicle bombs adjacent to concrete barriers can break the barriers into high-velocity projectile fragments that threaten occupied structures]

- ☐ Can concrete barriers be backed by soil or soil-filled bins to mitigate fragmentation?

- ☐ Can barrier combinations and layers be separated by a minimum of 30 ft. (9.15 m) clear zones on the sides and between layers for adequate observation and maintenance?

- ☐ Can additional barrier toppings be added to outer and inner ECP perimeter walls? [These include concertina wire, multiple-strand razor or barbed wire, or other devices that deter enemy efforts to vault or scale the barrier.]

- ☐ Can barriers provide mounting locations for ECP sensors, surveillance platforms, and lighting?

- ☐ Can barrier placement prevent enemy use as cover and concealment? [Eliminate enemy hiding places with concertina wire, multiple-strand razor or barbed wire, or expedient devices.]

- ☐ Will barriers be continuously monitored with intrusion detection systems (IDS) and patrolled/observed by security force personnel?

- ☐ Do barrier weak points exist that require continuous monitoring? [Consider IDS to detect and assess intrusion attempts.]

- □ Are vehicles - including destroyed and captured enemy vehicles - available for expedient barrier use? [Parked bumper-to-bumper, vehicles provide an effective personnel barrier. Large construction-type vehicles or armored vehicles are effective supplemental barriers behind gates or as a temporary serpentine in ECPs.]

- □ Can barriers be frequently inspected and maintained? [Barriers can be compromised through breaching or erosion and should be inspected at least weekly and maintained as required]

- □ Can overwatch and protective fires be integrated to support perimeter barriers?

- □ Can barriers be placed to eliminate line-of-sight (LOS) surveillance and conceal ECP activities?

- □ Has a threat assessment identified a specific explosive threat?

- □ What are the type, weight and expected speed of threat vehicles?

- □ Have all impact points along the perimeter been identified and can barriers be used to mitigate these points?

- □ Will the barrier absorb the kinetic energy developed by the threat vehicle?

- □ Will the barriers be subject to severe environmental conditions?

- □ Is the selected barrier designed to resist corrosion or other environmental effects?

- □ Will barriers interfere with established clear zone requirements?

- □ Does the active barrier have a manual override in case of power failure?

- ☐ Have appropriate safety features being considered?
- ☐ Has the selected barrier been crash tested?

Additional ECP Barrier Considerations

Clear Zones. Each Service has established varying dimensions for clear zones. As a general rule, a clear zone should be created at least 30 feet (9.2m) on both sides of an ECP boundary barrier. Clear zones must be kept free of vegetation and debris that might conceal intruders. Vegetation within any clear zone should not exceed 6 inches (152mm) in height. If clear zone requirements are not feasible then other measures should be considered; consider increasing barrier height, increasing security-patrol coverage, additional security lighting, or installing a perimeter sensor system. Objects that present no aid to circumvent the ECP perimeter barrier or do not provide concealment to an intruder (patrol road, light poles) may be permitted to stay within the clear zone.

Obscuration Screens. ECP perimeter barriers can be used in conjunction with obscuration screens to block direct lines-of-sight observation from outside the perimeter (Figure 3-4). Screening reduces targeting opportunities from direct fire weapons. Obscuration screens do not provide direct fire weapons protection. However, some obscurations screens can function as pre-detonation screens to help protect against direct shoulder-fired rockets. Obscuration can also be accomplished with trees, dense vegetation, chain-link fences, wooden fences, camouflage netting, and soil berms. Obscuration screens should allow small-base ECP security personnel outward visibility.

Sniper Screens. The combination of obscuration screens and ECP perimeter barriers are also an effective deterrent against snipers. Berms, tall concrete barriers, soil-filled containers and the modular protective system can provide protection from snipers. These barriers can be positioned at building entrances and exits where personnel gather. Camouflage netting is an expedient obscuration method (Figure 3-5). Apply netting to areas where personnel might be observed. When hard stand buildings are not available, tents offer concealment for many operations (e.g., maintenance, logistics, food service, and religious services).

Figure 3-4. Obscuration Screen on Perimeter Fence (AFH 10-222v3)

Figure 3-5. Netting Used for Obscuration (Joint Sniper Defeat Handbook)

Drainage Culverts and Utility Openings. Culverts, storm drains, sewers, air intakes, exhaust tunnels, and utility openings that pass through or under the ECP require special protective measures. Openings with a cross-sectional area of at least 96 sq. in. (0.06 sq. m) or greater with the smallest dimension being greater than 6 in. (150 mm) must be secured. Measures include securely fastened grills, locked manhole covers, or equivalent means that provides security penetration resistance of approximately 2 minutes (Figures 3-6 and 3-7). *MIL-HDBK-1013/10, Military Handbook Design Guidelines for Security Fencing, Gates, and Guard Facilities,* provides detailed design options.

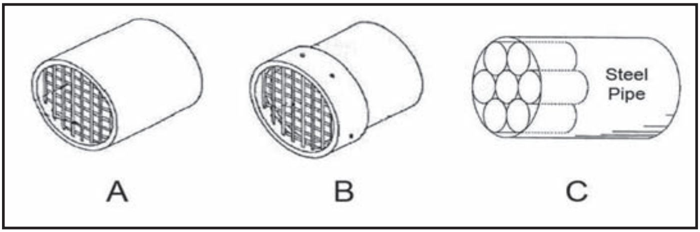


Figure 3-6. Culvert grill examples. A: Steel culvert grill; B: Concrete culvert grill; C: Large culvert with short honeycomb pipes. (MIL-HDBK-1013/10)

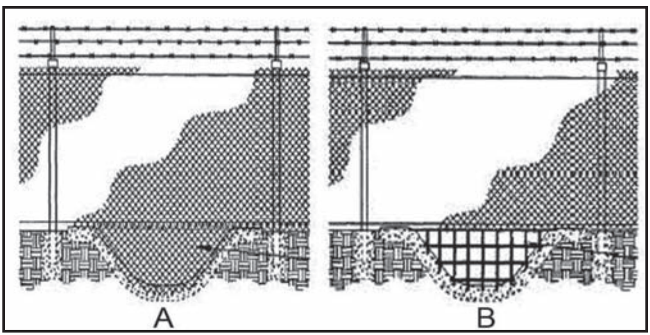


Figure 3-7. Under-fence utility openings. A: Swale crossing with ground stakes; B: Bar grill embedded in concrete. (MIL-HDBK-1013/10)

Double-Wall Perimeter System. A double-wall perimeter system is effective against a two-stage VBIED attack; the system is capable of stopping a second VBIED after detonation of a first VBIED. This concept includes an outer low-wall for standoff and inner high-wall that provides obscuration and direct fire protection (Figure 3-8). This combination also allows for observation and engagement of clear zones from overwatch towers and fighting positions. Use soil-filled containers to minimize the debris and fragment hazard. Existing sites may require the backing or replacing of concrete walls with soil-filled containers. The double-wall configuration was successfully tested against two consecutive 4,000 lb. (1,818 kg) TNT-equivalent dump truck VBIEDs.

Soil-filled containers or vehicle ditches are preferred for the outer low-wall since they do not create debris hazard. Double jersey barriers with soil between them are an acceptable alternative. The soil will mitigate the velocity of concrete debris. Place the outer barriers on a good soil foundation rather than on a concrete or thick asphalt road surface to minimize debris.

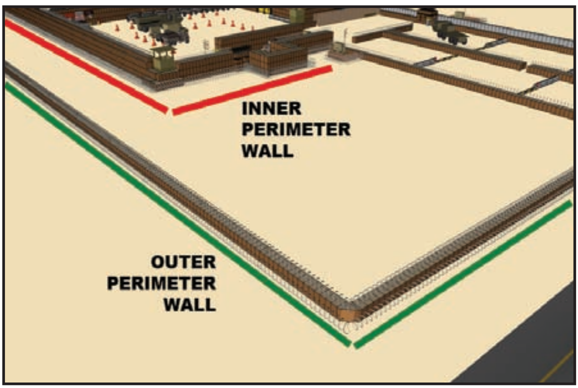


Figure 3-8. Double-wall perimeter concept

VEHICLE BARRIERS

Vehicle barriers accomplish many ECP design requirements including containment, segregation, and compartmentalization of vehicles, rejection of unauthorized vehicles, channelization of vehicles into and through ECPs lanes and vehicle speed management. Vehicle barriers are also used at the small-base perimeter to establish adequate standoff distance. Active and passive barriers are more effective when combined together and integrated into the adjacent perimeter barrier system. Barriers should not be employed alone, as the only protection solutions. Rather, barriers should be designed to complement other physical and procedural security measures.

Vehicle barriers are effective personnel barriers when coupled with multi-strand razor or concertina wire toppings. Vehicle barriers should be focused along high speed and straight-line avenues of approach. Vehicle barriers are generally categorized as passive or active. Depending on construction method and operational function, commercial barriers can be dual-classified when they meet the requirements of both categories (fixed-active, portable-passive, etc.).

Include the following vehicle barrier considerations in ECP designs:

- □ Select barriers based on their ability to stop threat vehicles
- □ Consideration should be given to the potential for debris and fragment hazard produced by concrete barrier systems exposed to a blast during an attack; soil-backed concrete barriers and soil filled bins will help mitigate debris and fragments
- □ Employ movable, easily operated barriers at entrances to maintain positive traffic control/flow
- □ Construct ECP perimeter walls with passive vehicle barriers

- ☐ Create nonlinear, serpentine lanes throughout the ECP with vehicle barriers to control traffic flow into the search area and through lanes
- ☐ Select barriers with limited profiles for ECP interior walls/lanes to minimize intruder cover and concealment positions
- ☐ Select and locate barriers to limit or block enemy surveillance and observation attempts
- ☐ Arrange barriers in a continuous layout to contain vehicles and prevent the circumventing of the ECP once a vehicle has entered
- ☐ Construct a final denial barrier at the small-base entrance to complete containment
- ☐ Position barriers away from trees, telephone poles, antenna masts, or adjacent structures to prevent barrier circumvention
- ☐ Place barriers in concert with each other, the natural terrain, and any man-made obstructions
- ☐ Emplace barriers in concert with each other, the natural terrain, and any man-made obstructions
- ☐ Combinations or layers of barriers are more effective than a single barrier
- ☐ When a single barrier cannot stop a vehicle, combinations or layers of barriers are more effective; separate layers by a minimum 30 ft (9.15 m) clear zone for increased protection and control
- ☐ Maintain unobstructed clear zones on both sides and between barriers

- □ Install additional personal barrier toppings on ECP perimeter walls to inhibit efforts to vault or scale the wall; concertina, multi-strand razor, and barbed wire are all effective
- □ Install multi-strand concertina or razor wire along the top and outer base of perimeter walls to prevent their use by attackers as cover/protection
- □ Employ movable personnel barriers in conjunction with movable vehicle barriers at ECP entrances; staked strands of concertina or razor wire will deter unauthorized personnel entry
- □ Continuously monitor, patrol, and inspect barriers
- □ Augment perimeter barriers with IDS, if available
- □ Integrate overwatch and final protective fires to support the ECP barrier system

Barrier Performance. Vehicle speed at the point of barrier impact greatly influences barrier performance. The highest attainable vehicle speed results from a long, straight path between the starting point and barrier. A threat vehicle's destructive energy depends on its weight and speed (known as kinetic energy). For example, a heavier, slow-moving vehicle can deliver the same destructive energy as a lighter, fast-moving vehicle. UFC 4-022-02, *Selection and Application of Vehicle Barriers provides additional details.*

Full-scale testing determines barrier performance capabilities. Barrier selection can also be based on engineered computer models. The US Departments of State and Defense rate barriers based on full scale crash tests conducted by independent test laboratories or government-approved facilities. For current barrier certifications see the USACE Protective Design Center website: (https://pdc.usace.army.mil/library/BarrierCertification/)

Vehicle Barrier Types. Typical ECP vehicle barriers include: berms and ditches, concrete barriers (Jersey, Texas, Alaska), soil-filled barriers, reinforced concrete walls, cabled concrete blocks, guardrails, bollards, steel cable-reinforced chain-link fence, plastic barriers, reinforced concrete knee walls, cabled steel hedgehogs, tetrahedrons and dragon teeth, tire shredders, hydraulic security barriers, portable hydraulic barriers, and expedient barriers.

Berms and Ditches. Berms and ditches, used in concert together, are effective vehicle deterrents that provide a simple method of rapidly securing a ECP perimeter. Well maintained berms and ditches can act as permanent ECP perimeter barriers or as temporary barriers during small-base/ECP construction until permanent barriers are installed. Berm and ditch profiles, including approach slopes, are critical design considerations.

There are two vehicle attack methods commonly used against ditches. First, a slow, covert attack where a vehicle attempts to breach the ditch at an oblique angle, using the ditch profile to the vehicles' advantage. Second, a fast-attack vehicle approaches the ditch perpendicularly and attempts a high-speed jump to breach the near edge of the ditch. Ditches are also vulnerable to coordinated attacks where a lead vehicle modifies the ditch profile, and then a full attack is mounted before the ditch is repaired.

Numerous profiles for vehicle ditches have been proposed in previous DoD documents. These ditch profiles were based on ditch profiles used primarily to slow tank attacks and were not tested against simulated moving terrorist vehicle bombs until recently. The results of these tests along with simple trajectory simulations have led to revised ditch profile designs. The ditch profiles shown in Figures 3-9, 3-10 and 3-11 are recommended for medium-sized sport utility vehicles (SUV) traveling at up to 50 mph. The profile in Figure 3-9 provides the greatest resistance against a moving vehicle threat, but requires a stabilized slope, such as concrete riprap or sand-bag cover, since natural soil cannot maintain a 45 degree slope. The profile in Figure 3-10 provides less resistance, but sandy soil can theoretically maintain a 34 degree slope. Finally, the profile in Figure 3-9 is similar to Figure 3-11 except that it does not have the additional safety factor of a berm for stopping a moving vehicle threat.

Soil berms adjacent to the protected (near) side of the ditch provide additional vehicle resistance, but can also create hiding places for attackers on foot and as a result should be enhanced with personnel barriers. This is less significant when overwatch positions and guard towers can cover the ditch. Soil berms and spoil placement from ditch excavation should not be placed on the attack (far) side of the ditch because this can inadvertently create a ramp that allows high speed vehicles to jump the ditch.

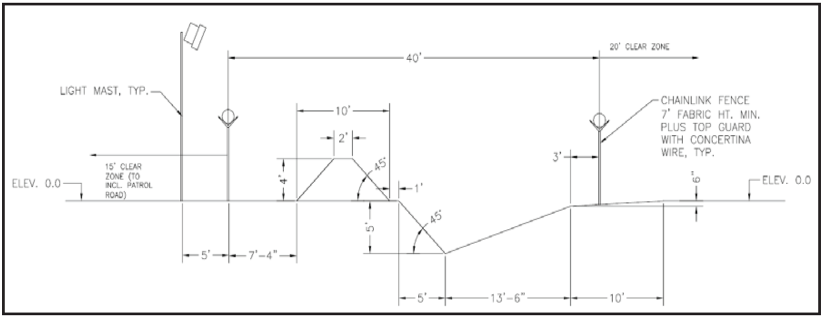


Figure 3-9. Vehicle ditch profile with stabilized slope. Protected side is to the left. (UFC 4-022-02)

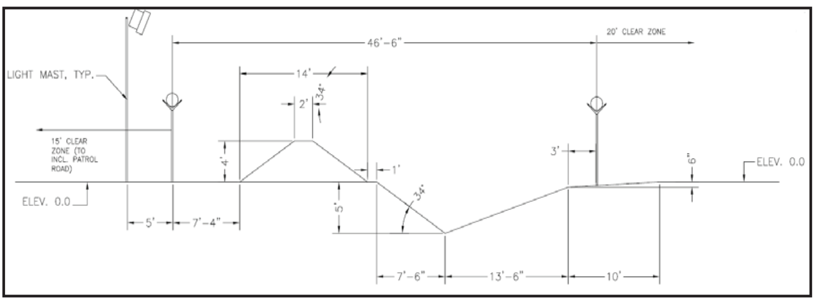


Figure 3-10. Vehicle ditch with slope not stabilized. Protected side is to the left. (UFC 4-022-02)

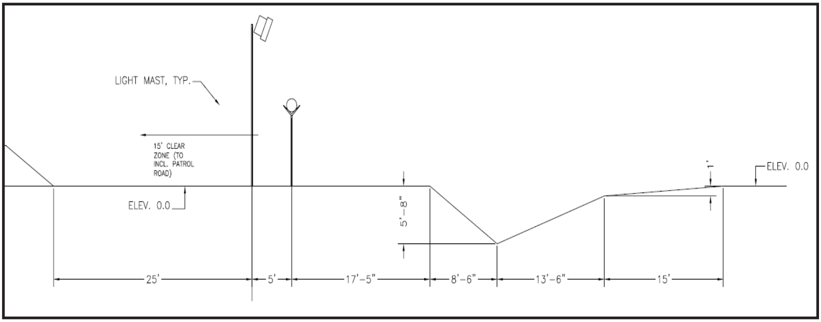
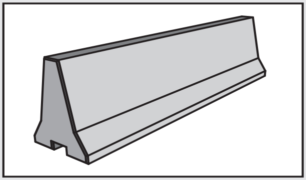


Figure 3-11. Vehicle ditch with no berm and slope not stabilized. Protected side is to the left. (UFC 4-022-02)

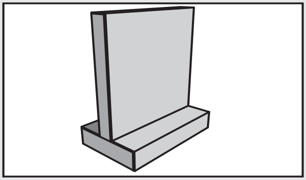
Concrete Barriers. Concrete barriers (Figure 3-12) are among the most widely employed ECP vehicle barriers and are readily accepted by HNs because of their temporary nature. Concrete barriers are typically employed for counter-mobility, blast/fragment mitigation, and along avenues of approach. Sufficiently high concrete barriers will stop VBIED fragments. However, these barriers can disintegrate and become secondary debris fragments in the immediate vicinity of large explosions. Soil-backed concrete barriers are less likely to create secondary debris fragments (Figure 3-13).

Smaller concrete (jersey) barriers are most effective when cabled together. Cabling causes a ramming vehicle to push the entire wall's weight instead of a single barrier. At least 3/4 in. (1.9 cm) steel cable is recommended. If the potential threat vehicle angle of impact can exceed 30 degrees, concrete barriers should be anchored to a concrete foundation.



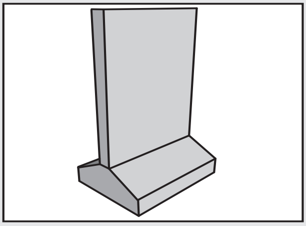
JERSEY BARRIER

Height: 3 ft.
Bottom Length: 10 ft.
Bottom Width: 2 ft.
Top Width: 10 in.
Weight: 2 Tons



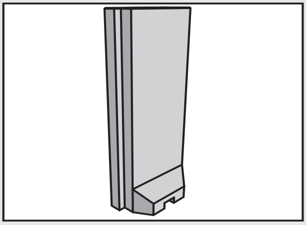
TEXAS "T" BARRIER

Height: 6 ft.-8 in.
Bottom Length: 6 ft.-8 in.
Bottom Width: 3 ft.-3 in.
Top Width: 1 ft.-9 in.
Weight: 6 Tons



ALASKA BARRIER

Height: 10 ft.
Bottom Length: 6 ft.-1 in.
Bottom Width: 4 ft.-4 in
Top Width: 1 ft.
Weight: 7 Tons



INTERLOCKING T-WALL

Height: 12 ft.
Bottom Length: 5 ft.
Bottom Width: 4 ft.
Top Width: 1 ft.-3 in.
Weight: 6 Tons

Dimensions shown are approximate and can vary by manufacturer.

Figure 3-12. Typical Concrete Barriers

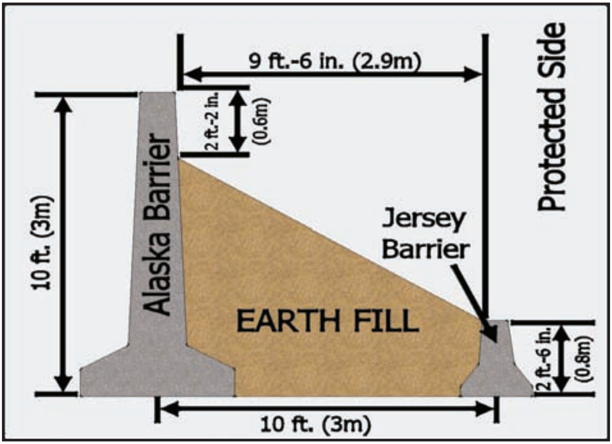


Figure 3-13. Soil-Backed Concrete Barrier Concept

Soil-Filled Barriers. Soil-filled barriers are typically employed as vehicle barriers and for both blast and fragment protection. Soil-filled barriers are also used for fighting positions and shelters.

- **Wire and Fabric Container.** Wire and geotextile fabric containers are effective perimeter barriers. Use of this barrier minimizes transportation weight and space while increasing protection. Geotextile barriers are normally constructed with two-row wide bases and a second level for vehicle-stopping mass (Figure 3-14). In experimental tests, this design stopped a 15,000 lb. (6,818 kg) truck traveling at 30 mph. (48.2 kph).

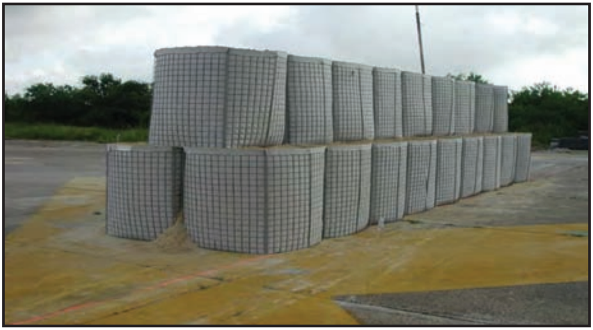


Figure 3-14. Wire and Fabric Container Barrier (UFC 4-022-02)

- **Metal Container.** Metal soil-filled containers are effective vehicle barriers (Figure 3-15). Like wire and fabric containers, metal barriers can be collapsed and stacked during transport and require minimum logistical support.

Figure 3-15. Metal Container Barrier

Reinforced Concrete Walls. Reinforced concrete and reinforced concrete masonry unit (CMU) walls can be a costly, labor-intensive yet effective vehicle barrier. For effectiveness, these walls should be smooth-faced, topped with outriggers or other material (razor wire, general purpose tape obstacle, barbed concertina wire), and be at least 9 ft. (2.7 m) tall. While walls provide more structural support than chain link fences to a climbing intruder, walls provide fewer handholds. Explosives can breach concrete walls. Table 3-1 provides wall thicknesses resistive to explosive breaching.

Table 3-1. Concrete Barrier Wall Thicknesses to Prevent Debris from Explosives (USACE TM 5-855-1)

Standoff ft (m)	Wall Thickness to Prevent Breaching,* inch (cm)					
	220 lb (100 kg)	440 lb (200 kg)	1,000 lb (454 kg)	2,200 lb (1,000 kg)	4,400 lb (2,000 kg)	22,000 lb (10,000 kg)
0 (0)	43 (110)	55 (140)	76 (194)	No data	No data	No data
4.9 (1.5)	30 (76)	44 (111)	67 (170)	No data	No data	No data
8.2 (2.5)	23 (59)	35 (88)	55 (140)	No data	No data	No data
16.4 (5)	15 (38)	23 (59)	39 (98)	62 (157)	No data	No data
32.7 (10)	9 (23)	15 (37)	25 (63)	41 (104)	52 (133)	137 (347)
*For barrier concrete with 2000 psi (13.8 MPa) compressive strength.						

***For barrier concrete with 2,000 psi (13.8 MPa) compressive strength. This data applies to concrete wall barriers without material backing.**

Cabled Concrete Blocks. Like concrete barriers, cabled non-reinforced concrete blocks (Figure 3-16) can effectively slow oncoming vehicle speeds along small-base perimeters or ECP access roads. Concrete blocks alone will not stop vehicles. Blocks can be cast in place and anchored together with 3/4 in. steel cable to prevent movement or removal. Concrete blocks are most effective when placed in a serpentine pattern.

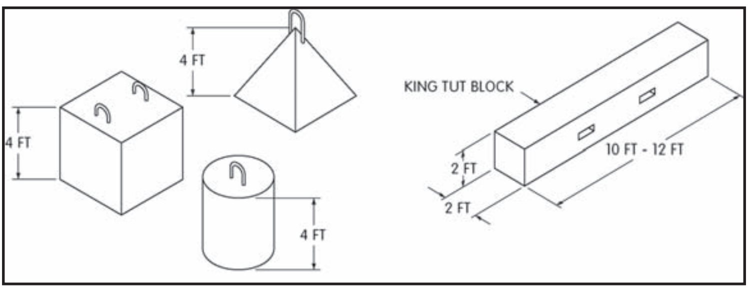


Figure 3-16. Typical Cabled Concrete Blocks (UFC 4-0222-02)

Guardrails. Standard highway guardrails (Figure 3-17) installed on an ECP perimeter or to form lanes can be effective vehicle barriers. Typical guardrail types and dimensions are detailed below:

- □ Cable guardrail (American Association of State Highway Transportation Officials (AASHTO) type G1) consists of three 3/4 in. (1.9 cm) diameter steel cables spaced 3 in. (7.6 cm) apart. The posts are S3x5.7 steel, spaced at 16 ft. (4.9 m) intervals. The height from surface to top rail is 30 in. (76.2 cm). From the end post, all three cables are turned down at 45-degree angles and anchored to buried concrete deadmen.

- □ W-beam flexible guardrail (AASHTO type G2) consists of a 12 gauge "W" section bolted to S3x5.7 steel posts, spaced at 12.5-ft. (3.8 m) intervals. A Blocked-Out W beam (AASHTO type G4) guardrail system uses 12 gauge "W" sections bolted to W6x8.5 posts, spaced at 6.25-ft (1.9 m) intervals. A three-beam (AASHTO type G9) guardrail system consists of a steel three-beam bolted to W6x8.5 steel posts at 6.25-ft. (1.9 m) intervals.

- □ Box-beam guardrail (AASHTO type G3) consists of a 6 in. x 6 in. x 0.180 in. (15.2 cm x 15.2 cm x 0.46 cm) steel tube bolted to S3x5.7 steel posts, spaced at 6.33-ft. (1.9 m) intervals.

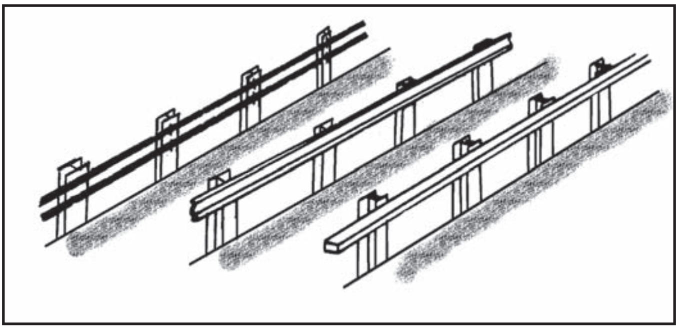


Figure 3-17. Typical Guardrail Construction (UFC 4-022-02)

Bollards. Bollards are metal or concrete columns anchored into the ground. Figure 3-18 shows a bollard construction drawing. Bollards can be active or passive barriers. Active entry control bollards can be pulled from the ground by hand or hydraulically raised and lowered. Effective passive bollards are constructed of structural steel pipe filled with concrete. Steel pipes should have an 8 in. (20 cm) minimum outside diameter; pipe walls should be 1/2 in. (1.3 cm) thick and a minimum 7 ft. (2.1 m) length. Bollards should extend 3 ft. (0.9 m) above ground from a 2 ft. wide continuous footing. Place bollards 3 ft. (0.9 m) apart on center. Avoid bollard placement along unsecured sides of perimeter fences to prevent the bollard being used as a climbing aid.

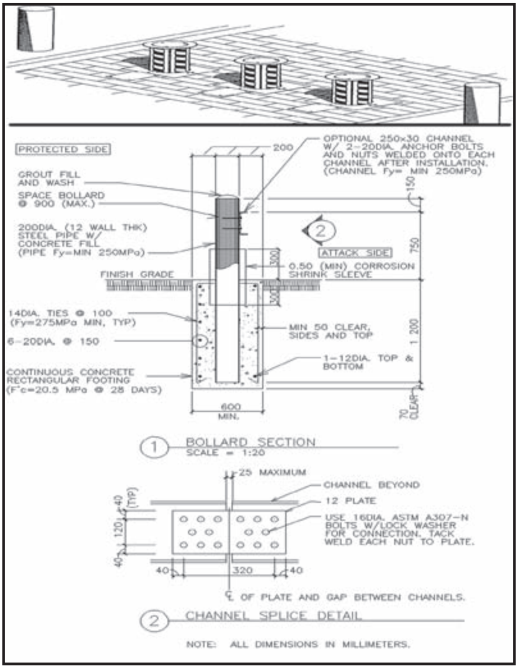


Figure 3-18. Typical Bollard Construction Detail (Above: Retractable bollards; Below: Fixed bollard construction detail) (UFC 4-022-02)

Steel Cable-Reinforced Chain-Link Fence. Chain-link fences can be utilized as vehicle barriers by reinforcing the fence line with steel cable (Figure 3-19). This is a low-cost, low-profile barrier option. Reinforce fences with two 3/4 in. (19.1 mm) steel cables tied to the fence at heights of 30 in. and 35 in. (0.76 and 0.89 m) above ground. Attach each end cable end to a concrete deadman anchor. Reinforcing posts placed at 4 ft. (1.2 m) intervals further reduce vehicle penetration. Crash tests conducted on chain-link fence reinforced with two 3/4 in. (19.1 mm) aircraft cables restricted penetration of a 4,000 lb. (1,814.4 kg) vehicle traveling at 52 mph (84 kph) to 13 ft. (3.9 m).

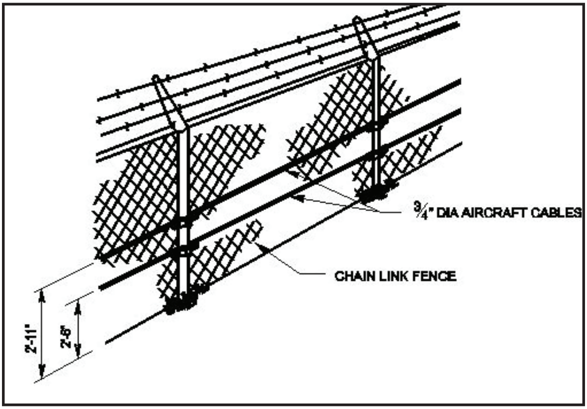


Figure 3-19. Typical Cable-Reinforced Chain-Link Fence (UFC 4-022-02)

Plastic Barriers. Plastic barriers can be used for channelizing vehicles into or through an ECP. Plastic barriers (Figure 3-20) are molded in a configuration similar to jersey barriers. Plastic barriers weigh approximately 130 lbs. empty and 1,600 to 1,800 lbs. filled with water. The units are made from easily transported polyethylene sections. Sections must be linked for added vehicle impact resistance and reduced lateral barrier movement. Surface mounting limits barrier effectiveness to impacts below 15 mph (24 kph) and angles less than 25 degrees.

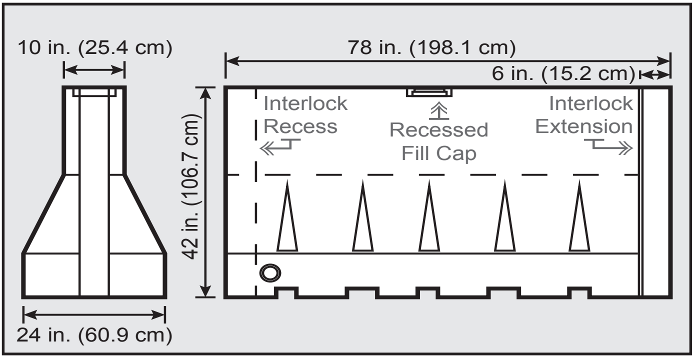


Figure 3-20. Plastic Barrier System (UFC 4-022-02)

Reinforced Concrete Knee Wall. When a perimeter wall or chain-link fence needs to serve as a vehicle barrier, this can be achieved by using a reinforced concrete knee wall structure. Concrete knee wall barriers rest on footings embedded in existing soil or a crushed stone mix. Figure 3-21 shows construction details. In experimental tests, this barrier stopped a 15,000 lb. (6,818 kg) vehicle traveling at 50 mph (80 kph) in 3.28 ft (1 m).

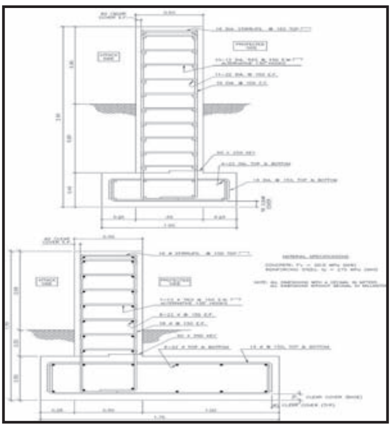


Figure 3-21. Anti-Ramming Walls. Left: Foundation wall; Right: Knee wall. (UFC 4-022-02)

Cabled Steel Hedgehogs. These barriers are designed to roll beneath a ramming vehicle and destroy its driveshaft and undercarriage. Hedgehogs must be used on paved areas. When cabled to adjacent barriers, hedgehogs will stop a vehicle. Typical hedgehog construction includes three 4 in. by 4 in. (10.1 cm by 10.1 cm) pieces of angle iron approximately 4 ft. (1.2 m) in length. The pieces are welded to a 4 in. (10.1 cm) steel plate (Figure 3-22).

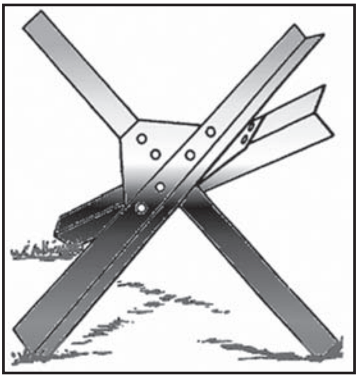


Figure 3-22. Steel Hedgehog (AFH 10-222v14)

Tetrahedrons and Dragon's Teeth. Tetrahedrons are pyramids with triangular bases; dragon's teeth are pyramids with square bases (Figure 3-23). Both are constructed from angle iron or concrete and employed in multiple rows at 4-ft. to 5-ft. (1.2 to 1.5 m) intervals across an avenue of approach. Rows can be aligned or staggered. Both barriers are most effective when cabled together.

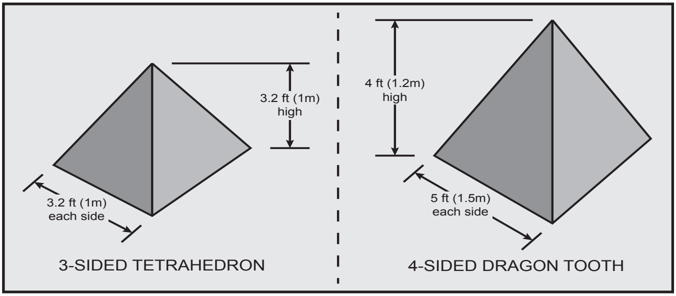


Figure 3-23. Tetrahedron and Dragon Tooth (AFH 10-222v14)

Hydraulic Security Barrier. This barrier is well-suited for use at ECP entrances/exits and in lanes to control or stop vehicles. The hydraulic security vehicle barrier (Figure 3-24) is commercially available, fully electronic, and multi-functional. Multiple barriers can be controlled from a single hydraulic power system. Most models can be installed in 24 hours without roadway construction by bolting the barriers to the roadway. This barrier type can also be installed below ground and flush-mounted. Most models are similar in construction and operation, varying only in barrier height and foundation construction. Tests have shown a 14,980 lb. (6,809 kg) vehicle traveling at 50.3 mph (81 kph) failed to penetrate this barrier.

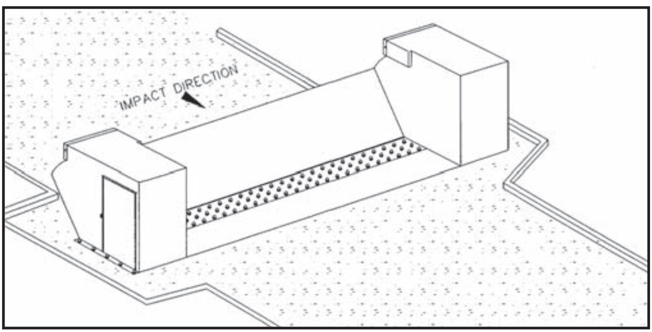


Figure 3-24. Typical Hydraulic Security Barrier (UFC 4-022-02)

Portable Hydraulic Vehicle Barriers. This barrier is well-suited for use at ECP entrances/exits and in lanes to control or stop vehicles. The portable hydraulic vehicle barrier (Figure 3-25) is commercially available, relocatable, self-contained, and controllable as a manned checkpoint. Unmanned control options include an electronic card reader or keypad. The self-contained hydraulic system is located in the curb panels and sealed to prevent fluid leaks. This unit can be placed on any roadway or other flat surface with passive barriers installed to prevent bypass. Once power is connected, the system is operational. This barrier is best employed at small-bases, where portability is required or a high water table limits buried barrier options. Tests have shown that this barrier is capable of stopping a 15,200 lb. (6,909 kg) truck traveling at 50.5 mph (81 kph).

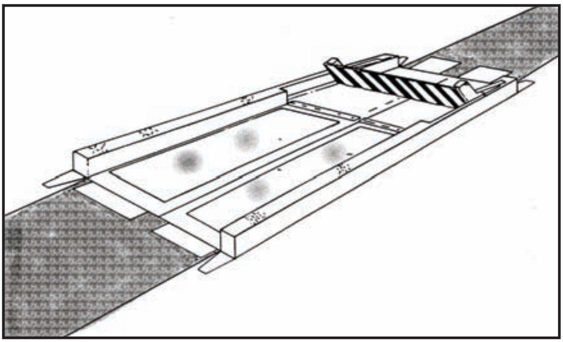


Figure 3-25. Typical Portable Vehicle Surface Barrier (UFC 4-022-02)

Expedient Barriers. Expedient barriers can be built from common construction items or available vehicles. Large-diameter concrete culverts and steel pipes can form makeshift barriers. Large, high mass construction vehicles such as dump trucks and earth moving equipment can be modified for expedient barrier use. Expedient barriers should be stabilized and anchored to reduce displacement by a ramming threat vehicle. Expedient barrier materials include:

- Three-foot (0.9 m) sections of large-diameter, corrugated metal or reinforced concrete culverts placed on end and filled with sand or earth
- Steel pipe stacked and welded together in a pyramid
- Construction vehicles or damaged military vehicles anchored together with cable or chain
- Half-buried, heavy equipment tires (Figure 3-26); employ rigid 7 to 8-ft (2.1 to 2.4 m) diameter tires

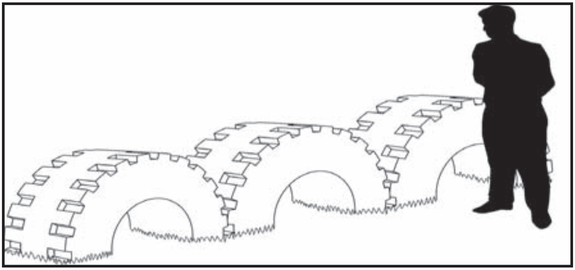


Figure 3-26. Typical Heavy Equipment Tire Barrier Construction (UFC 4-022-02)

Tire Shredders. When used in combination with the previously discussed vehicle barriers, tire shredders can effectively be used for traffic control purposes and to slow or stop a vehicle by deflating its tires (Figure 3-27). When crossed in the wrong direction, shredder spikes penetrate the tire casing, which deflates the tires and limits vehicle mobility. Shredders are available from many commercial manufacturers, but should not be considered stand-alone vehicle barriers due to limited stopping capability. Tire shredders are not recommended where vehicle traffic crosses these devices at speeds exceeding 5 mph (8 kph). These systems may also not be effective against run-flat tires, heavy truck tires, or tires that can bridge two or more shredder spikes.

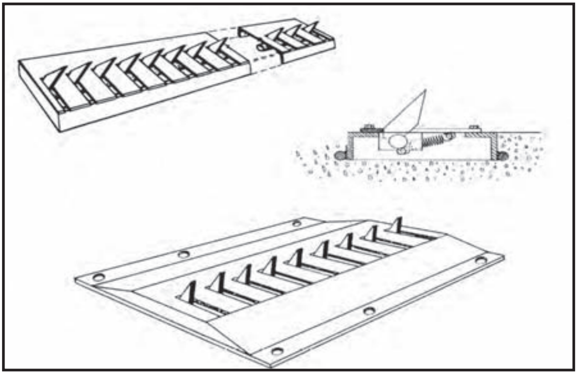


Figure 3-27. Tire Shredders (UFC 4-022-02)

PERSONNEL BARRIERS

Personnel barriers are designed to define the perimeter, direct and control personnel traffic flow, establish clear zones, and deter unauthorized entry into the small-base. Personnel barriers are more effective when used in conjunction with berms and ditches and tall vehicle barriers such as concrete barriers, soil-filled barriers, metal barriers, and reinforced concrete walls. Typical personnel barriers include chain-link fences with barbed wire outriggers, multi-strand razor and concertina wire fences, concrete walls (see Reinforced Concrete Wall discussion), and barbed wire fences.

Personnel barriers should be used along the outer and inner ECP perimeter walls and at the ECP entrance. Install triple-strand concertina, razor wire, etc., along the top and outer base of the outer ECP perimeter wall to prevent attackers from using the low wall as cover/protection during an attack. Personnel barriers should also be installed as a topping for the inner ECP perimeter wall as an anti-climb measure. A movable personnel barrier should be used in conjunction with the movable anti-vehicle barrier at the ECP entrance. A staked strand of concertina or razor wire will deter unauthorized personnel from entering the ECPs.

Most personnel barriers/fences are easily penetrated by moving vehicles and will resist impact only with reinforcement. In most instances, fences can be penetrated by climbing over or burrowing under them or using wire cutters to cut holes. Consequently, fences must remain under constant observation and clear zones established and maintained. Additional security fencing details can be found in MIL-HDBK-1013/10, *Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities.*

Chain-Link and Metal Mesh Fence Selection Considerations

- □ Can fences be located to prevent circumvention by use of terrain features or structures (buildings, utility tunnels, light and telephone poles, ladders)?

- □ Can chain-link and metal mesh fences be anchored with metal posts placed in concrete at intervals no greater than 9 ft. (2.7 m)?

- □ Can fences be topped with razor wire, general purpose tape obstacle (GPTO), barbed concertina wire, or barbed wire outriggers (listed in order of most effective to least effective)?

- □ Can fence height, including outriggers, reach 8 ft. (2.4 m)?

- □ Can horizontal wire be woven through the bottom and top of the fence to keep the edges rigid?

- □ Will the bottom fence edges extend no more than 4 in. (10.2 cm) above ground? [Preferred installation includes concrete footings that encase fence bottoms around the entire perimeter. This prevents lifting, delays burrowing, and diminishes erosion.]

- □ Can synthetic screens be woven into fences to prevent outside observation of the small-base? [Ensure the screen does not block outward observation]

Chain-Link Fencing. Chain-link fencing (Figure 3-28) is cost-effective and readily available. Razor, concertina or barbed-wire toppings enhance the effectiveness of chain-link fencing. Chain-link fences should be reinforced with steel cable (see Steel Cable-Reinforced Chain-Link Fence discussion and Figure 3-19) to resist vehicle penetration and laced with wire along the bottom edge to prevent lifting. Fences must be continually inspected for signs of tampering and to identify maintenance needs.

Figure 3-28. Chain-Link Fence with Razor Wire and Barbed-wire Outriggers

Multi-Strand Razor and Concertina Wire Fence. Razor and concertina wire are common expeditionary barriers that can be used as a topping for vehicle barriers or to create a stand-alone fence. To be effective razor and concertina wire must be staked or tied down; ensure wire is connected together and stakes are not too far apart. The most effective multi-strand razor or concertina wire fence (Figure 3-29) utilizes several rolls of stacked wire. For example, one roll is stacked on top of two rolls running parallel to each other, forming a pyramid. This barrier method delays intrusion and allows time for security force response and engagement.

Figure 3-29. Concertina Wire Fence

GATES

Gates facilitate the control and flow of authorized personnel and vehicle traffic and establish specific entrance/exit points for an ECP or defined perimeter. Gates also establish traffic patterns for restricted areas. ECP gates must provide at least an equivalent level of protection as the adjacent perimeter barrier system. Gates normally require additional hardening features. If used at the actual entrance into the small-base then the gate should be constructed as a final denial barrier with the capability to stop a threat vehicle. Hardening addresses the inherent vulnerabilities of hinges, latches, and associated mechanical devices. *MIL-HDBK-1013/10, Design Guidelines for Security Fencing, Gates, Barriers, and Guard Facilities* contains detailed design guidelines.

Chain-Link Personnel Gates. Chain-link personnel gates should be designed to permit only one person to approach security personnel at any time. Examples include single swing gates and double swing gates. For pedestrian use, consider single swing gates (Figure 3-30) as an alternative to turnstile gates. Also, consider operational and security requirements and security manpower availability in determining ECP personnel gate selection.

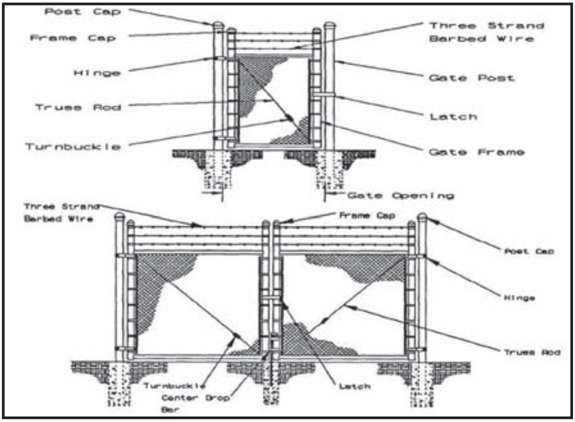


Figure 3-30. Typical Chain-Link Personnel Gates. Top: Single-Swing; Bottom: Double-Swing. (MIL-HDBK-1013/10)

Turnstile (Rotational) Gates. Turnstile gates (Figure 3-31) are recommended for personnel access control through ECPs or into restricted areas. Automated turnstile gates can lessen guard requirements for controlling personnel. Turnstile gates are manufactured as single or tandem units. Only consider full-height turnstile gates. Direction of travel can be clockwise, counterclockwise, or bi-directional. Automated access control systems, such as card readers, push button, and wireless remote can be incorporated into turnstile gates. Tubing should be at least 1-1/2in. (3.8 cm) diameter, 14 gauge (38 mm). Overall exterior height should be 91 in. (2.3 m) with a pedestrian walk-through height of 84 in. (2.1m).

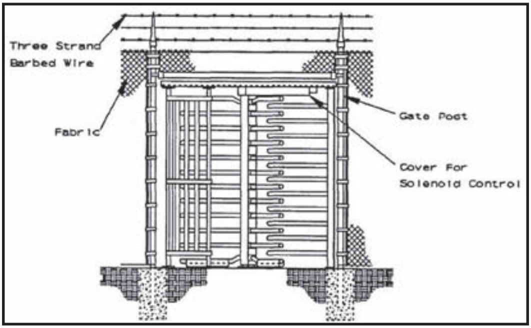


Figure 3-31. Turnstile (Rotational) Gate (MIL-HDBK-1013/10)

Cabled Crash Beam Barriers. Crash beam systems (Figure 3-32) are cable-reinforced, manually or hydraulically-operated, bollard-mounted barriers used as a vehicle gate. The beam is counterbalanced and lifts at one end to allow vehicle access. This system is frequently used for low impact conditions where vehicle speeds can be limited and as interior barriers for ECP vehicle inspection areas. Tests have shown a crash beam barrier successfully stopped a 10,000 lb. (4,545 kg) vehicle at 17 mph (27 kph).

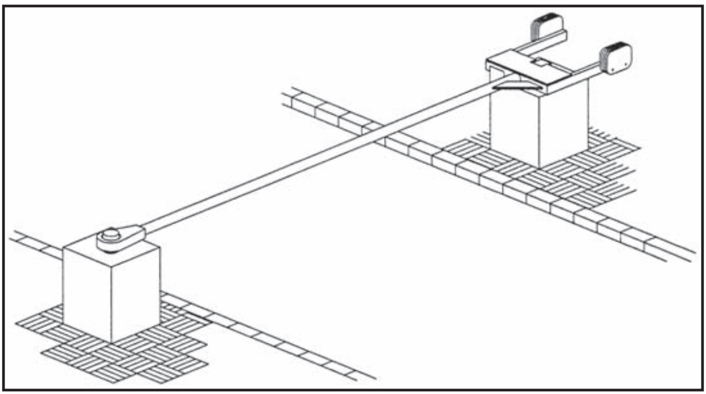


Figure 3-32. Typical Cable Reinforced Crash Beam Barrier (UFC 4-022-02)

Crash Gate. A crash gate system, (Figure 3-33) is a sliding gate that provides heavy vehicle impact resistance. Crash gates can be operated manually or electrically. Automated versions typically have a 30 to 100 ft/min (9 to 30 m/min) sliding speed (instantly reversible). Safety infrared sensors and front edge obstacle sensors are standard features. Gate systems are normally employed where wide openings are required (up to 25 ft. (7.6 m) clear opening). Tests have shown this gate will stop a 15,000 lb (6,818 kg) vehicle at speeds of 34 and 40 mph (55 and 65 kph respectively).

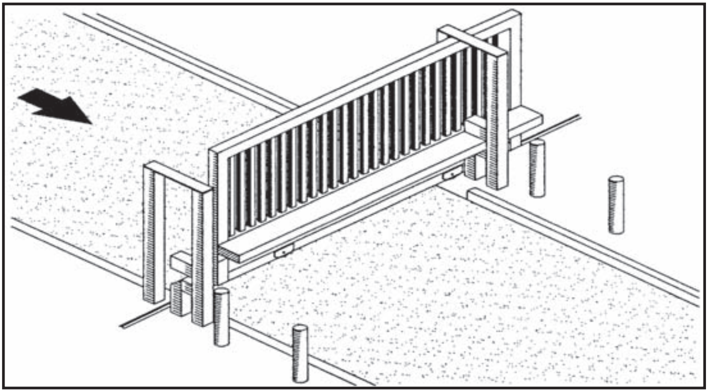


Figure 3-33. Crash Gate System (UFC 4-022-02)

Cable-Reinforced Chain-Link Fence Gates. If cable-reinforced chain link fence vehicle gates are employed, then wheel-supported or cantilever sliding gates offer the best vehicle security (Figure 3-34). Swing gates require a large arc of space for operation. The larger arc increases ECP vulnerability, making swing gates less desirable.

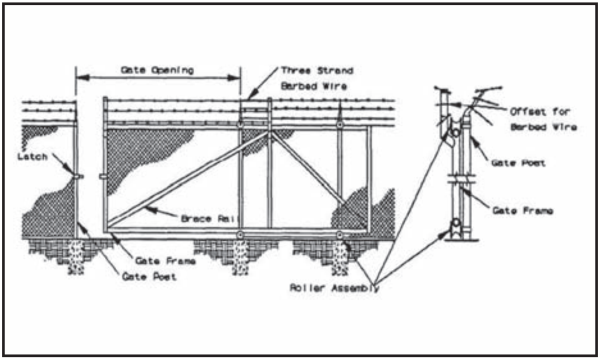


Figure 3-34. Single Cantilevered Gate (MIL-HDBK-1013/10)

Military Vehicle and Heavy Equipment/Trucks. If conventional gates are unavailable, military vehicles, trucks, bulldozers, and dump trucks will effectively block an entrance. To increase barrier effectiveness, thread cable through vehicle frames and anchor to adjacent barriers. Parked bumper-to-bumper, vehicles are also effective personnel gates. Large construction or armored vehicles can supplement vehicle gates and function as a final denial barrier.

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CHAPTER 4
ECP OPERATIONS

> ***"The supreme art of war is to subdue the enemy without fighting. The clever combatant imposes his will on the enemy, but does not allow the enemy's will to be imposed on him."***
>
> ***Sun Tzu***

ECP effectiveness is directly related to the training and skill of security force personnel. For that reason, small-base leaders should develop ECP operational procedures that project professionalism, commitment to mission accomplishment and protection of personnel, and ensure adequate training and exercises. Whether occupying an existing ECP or establishing a new one, a team approach is the most effective method of developing or reassessing operational procedures.

The *JEEP Handbook* (GTA 90-01-018) provides an excellent discussion of ECP operations, specifically:

- ◻ ECP Operational Objectives
- ◻ ECP Operational Principles
- ◻ ECP Concept of Operations
- ◻ ECP Threat Assessment Process
    - Rules of Engagement
    - Escalation of Force
- ◻ ECP Battle Drills

These topics will not be discussed again in this chapter.

Simply stated, the purpose of the small-base ECP is to serve as the entry point for all personnel, visitors and vehicles that enter the small-base. The primary objective for the ECP is to prevent unauthorized personnel and vehicles from gaining access onto the small-base. The challenge for ECP personnel is to complete this important task while simultaneously and seamlessly maintaining the small-base's protection measures. The following concepts and considerations are common for all small-base ECPs and should be incorporated into the operations of the ECP; however, ECP differences require that guidance be adapted and tailored to specific small-base requirements.

UNITY OF COMMAND

The small-base leader is responsible for the protection and operation of the small-base and the ECP. As such, the small-base leader should determine the preferred command relationship for mission accomplishment. The recommended type of command relationship is for the small-base leader to exercise unity of command through the temporary operational control (OPCON) or tactical control (TACON) over all available assets (tenant and transient units from other Services, functional components and coalition partners) that are assigned or attached to the small-base. The OPCON/ TACON command relationship should allow the small-base leader to take advantage of all available personnel to man and operate the ECP and establish the necessary level of security.

Coordination and cooperation among the units and personnel tasked with supporting and operating the ECP is critical to the success of the small-base ECP mission. Small-base command relationships should be established early and ideally prior to the units' occupying of the small-base.

BASE DEFENSE OPERATIONS CENTER

The ECP must be considered an integral part of the small-base perimeter and its operations must be fully integrated with the small-base defense operations and the Base Defense Operations Center (BDOC). The BDOC serves as the small-base leader's command and control facility and the focal point for base defense, force protection and security operations. As such, the BDOC should provide oversight of ECP operations, to include, but not limited to:

- □ Command and control of ECP supervisory personnel (ECP OIC/NCOIC)
- □ Development of ECP Standard Operating Procedures (SOP), including:
    - Access control procedures, search techniques, specific post orders
    - Escalation of force/rules of engagement (ROE) procedures
    - Manning requirements and tasking of assigned/attached units
    - Integration of HN security force personnel
    - Personnel training and equipment requirements
    - Contingency response plans/battle drills and integration of Quick Reaction Force (QRF)
    - Communications and reporting requirements
- □ Equipment and technology maintenance
- □ Implementation of RAMs for the ECP
- □ Inspection, training, battle drill, exercise requirements

ACCESS CONTROL

Small-base leaders must clearly define access control measures required to safeguard the small-base and ensure mission accomplishment. Specific access control measures should be developed to identify and screen personnel, vehicles, and materials to ensure that only authorized personnel gain entry to the small-base. Access control measures can also help detect contraband and mitigate the potential for sabotage, theft, trespass, terrorism, espionage, or other criminal activity. Small-base access control policies and procedures should accomplish the following:

- ☐ Determine the degree of control required over personnel, material, vehicles, and equipment entering or leaving the small-base

- ☐ Prescribe procedures to be followed during the search of persons (and their possessions) and vehicles prior to their entering or exiting the small-base

- ☐ Specify procedures for enforcing the removal of, or denying access to, unauthorized persons or vehicles

To be effective, access control procedures should be designed to increase the amount of time needed to gain access to the small-base in order to allow security personnel the time to assess, sound alarms, respond to and take immediate protective actions in the event of attack.

PERSONNEL ACCESS CONTROL PROCEDURES

> Preferred Method: The preferred type of access for a small-base in a high threat environment is one that limits access to only mission-essential personnel and vehicles and allows no access to commercial delivery truck or passenger vehicles; instead the small-base should establish a centralized off-site inspection and delivery/transfer point and an off-site controlled parking area.

Personnel access control should address procedures for coalition personnel, HN partners (police and armed forces), visitors, vendors, contracted workers (maintenance and support personnel), etc. The policy must clearly define the types of identification to be presented by personnel to verify authority and criteria for access. For example, if an exchange-pass system is used, the policy should contain a complete description of acceptable passes/badges. Personnel access control procedures must also define personnel search procedures and methods. The following methods should be used to maintain positive control over personnel access:

- **Access control lists**

  All authorized personnel should be listed on an access control roster for the small-base. This list should be meticulously reviewed, verified and compared with positive identification prior to the granting of access. Access control lists should be strictly controlled, continuously updated and never displayed to the public. If a computerized access list system is used, the computer files used to generate such a list must be safeguarded against tampering. Admission of persons other than those on the authorized access list should be approved by the small-base leader.

- **Exchange-pass system**

  An exchange-pass identification system may be employed to ensure stringent access control. This system involves exchanging one or more identification media (such as personal badges or passes) for another separate type of identifier (such as small-base specific badges or passes). This system is particularly useful in controlling visitors, vendors or contract workers. The process of exchanging passes is a personal transaction; permitting ECP security personnel an opportunity to examine closely all persons before they enter and exit the small-base.

☐ **Escort system**

Escorting is an effective method to control visiting personnel or contracted workers within a small-base. The escort must remain with the visitor at all times while he/she is within the small-base. If local written policy determines that an individual does not require an escort within the area, the individual must meet all the entry requirements for unescorted access. Escorts should be assigned or attached military personnel. A major objective in escorting visitors is to ensure that all material brought into the small-base by the visitor is searched for contraband or explosives and that no packages or other materials are left behind when the visitor departs.

VEHICLE ACCESS CONTROL PROCEDURES

The small-base leader must ensure that specific vehicle access control and search procedures are established and followed by ECP security force personnel. Vehicle access control procedures must address specific control measures to be followed, to include requirements for coalition and HN vehicles. Specific considerations for vehicle access control include:

☐ Vehicle/driver/passenger search requirements:

- Random
- 100 Percent
- Incoming
- Outgoing

☐ Methods of searching:

- Visual Searches
- Mechanical Searches
- Military Working Dogs
- Use of available technology (metal detectors, vapor sensors, etc.)

The JFOB Protection Handbook (GTA #90-01-011) and *JEEP Handbook* (GTA #90-01-011) provide additional detailed information concerning vehicle search techniques and procedures.

MATERIEL CONTROL PROCEDURES

Large vehicles concealing IEDs provide one of the most serious threats to small-bases. If delivery vehicles must enter the ECP for logistics purposes then the small-base leader must develop materiel control procedures to ensure the threat is minimized. The key to materiel control is to maintain direct control of the delivery vehicle at all times. The preferred method of materiel control is to prevent vehicles from entering the small-base interior by establishing an external logistics transfer yard. The DESIGN chapter provides a discussion on designing and building a logistics transfer yard.

The JFOB Protection Handbook (GTA #90-01-011) provides an excellent discussion of materiel control procedures to include techniques for maintaining positive control of delivery vehicles and the design and construction of materiel transfer points or trans-load yards.

ECP SECURITY FORCE

The ECP security force is often the first line of defense against hostile acts on a small-base and as a result is one of the most important elements of the small-base's protection mission. ECP security forces should consist of personnel specifically organized, trained, and equipped to provide security functions and operate the ECP. The small-base leader is responsible for ensuring that the security force is prepared to perform access control procedures and to detect, deter, delay and defeat attacks at the ECP.

ECP SECURITY FORCE CONSIDERATIONS

When determining the size and composition of the ECP security force, the small-base leader should address several critical factors:

- ☐ Size, location and mission of the small-base
- ☐ Specific threats to the ECP
- ☐ Number of ECPs
- ☐ ECP mission, type of access control procedures and required equipment/personnel and vehicle barriers
- ☐ ECP design and effectiveness of physical security equipment/personnel and vehicle barriers
- ☐ Availability of personnel from tenant units (assigned or attached tenant and transient units from other Services, functional components and coalition partners) to be used as part of the security force
- ☐ Integration of HN security personnel
- ☐ Availability of technology to be used as a force multiplier
- ☐ Quick Reaction Force (QRF) capability
- ☐ Planned upgrades

In all cases, a systems analysis approach should be used to determine ECP security force requirements. This analysis should not be based upon convenience. A systems approach to determining security force requirements should include a consideration of the following factors:

- ☐ What is the small-base leader's intent for the ECP security force?
- ☐ What security force strength and composition are needed to meet the leader's intent and mission? Is the strength and

composition commensurate with the degree of security protection required?

- ☐ What critical assets or unique systems are located at the small-base?
- ☐ What specialized equipment is needed for the ECP security force?
- ☐ What are the specialized training requirements for the ECP security force?
- ☐ What QRF elements are required to reinforce the ECP security force?
- ☐ What is the alert notification procedure for the QRF elements?
- ☐ What are the escalation of force/ROE procedures for the ECP security force?
- ☐ Who authorizes direct action by ECP security force personnel?
- ☐ Are no-notice exercises and rehearsals conducted of the ECP?
- ☐ Has an ECP SOP and individual post orders been developed?
- ☐ Are adequate visitor-escort procedures established and escort personnel available to preclude the use of ECP security force personnel as escorts?
- ☐ Are guard assignments and rotation times varied at frequent intervals to avoid establishing routines?
- ☐ Are periodic assessments of weapons and ammunition made to determine adequacy, and are measures taken to change allowances as appropriate?

ECP SECURITY FORCE POST ORDERS/CHECKLISTS

Small-base leaders should ensure that post orders and checklists are developed, published, signed, and maintained for each ECP security post. Also called Special Security Instructions (SSIs), Security Force Instructions (SFIs), and Special Security Orders (SSOs), security force post orders or checklists describe responsibilities for each post and authorize security force personnel to execute and enforce access control procedures.

The specific post requirements and operating procedures for the ECP should be established with the input of ECP security force personnel. Security force post orders/checklists should be specifically written for each post and should describe the security force member's duties in detail. The orders should be brief, concise, specific, written in a clear and simple language, and reviewed annually. A copy of post-specific orders should be maintained at each post. The checklists should include post-specific escalation of force/ROE, ROE scenarios, daily intelligence briefs, and range cards. Checklists should also help ECP security force members to identify threats and decide when to take actions not specifically spelled out in the ROE. The ECP post orders, at a minimum, should contain the following:

- ☐ Special orders for each ECP post which specify the limits of the post, specific duties and procedures to be performed, required arms and equipment
- ☐ Specific instructions in the application and use of deadly force/ escalation of force/ROE and detailed guidance in the safe handling of weapons
- ☐ Training requirements for ECP security personnel and designated posts
- ☐ ECP security force chain of command

ECP SECURITY FORCE TRAINING

Small-base leaders should ensure that all personnel assigned duties with the ECP security force receive, as a minimum, training in the following areas:

- □ The use of force/escalation of force/ROE procedures
- □ Safe handling of firearms
- □ Weapons proficiency training and qualification –different weapons may be manned by a variety of personnel; ensure that all personnel are not only familiar, but also proficient with every weapon that is on a security post, especially medium and heavy machine guns
- □ Legal aspects of jurisdiction and apprehension
- □ Mechanics of apprehension, search, and seizure
- □ General and special post orders and all aspects of the ECP security force SOP
- □ Access control procedures; specifically, vehicle and personnel search procedures
- □ Contingency response plans/battle drills and integration of Quick Reaction Force (QRF)
    - VBIED response
    - PBIED response
    - Dedicated assault actions
    - Indirect fire
- □ Integration of HN security force personnel

- ☐ Communications and reporting requirements
- ☐ Use of security force and ECP equipment and technology
- ☐ Specific threat awareness (i.e., VBIED, PBIED)
- ☐ Recent local trends in surveillance
- ☐ HN customs, courtesies, and sensitivities
- ☐ Basic counter-surveillance techniques
- ☐ Individual protective measures
- ☐ CBRNE personal protective measures
- ☐ Use of a phrase card containing key phrases (phonetically) in the HN language

ECP COMMUNICATIONS

Small-base leaders must ensure that a solid communications network, with both primary and secondary communications, is provided for the ECP to operate effectively and maintain situational awareness. The ECP communications system should allow continuous access to the BDOC. The communications system architecture must also be secure, robust (resistant to interference), redundant (alternate systems), and reliable (routinely maintained). As a minimum, the ECP communication network should provide the following capabilities:

- ☐ Maintain vigilance against attack
- ☐ Report status of posts
- ☐ Sound alarms

- ☐ Coordinate ECP response/actions
- ☐ Request assistance via BDOC
- ☐ Call for QRF
- ☐ Coordinate HN response and assistance

Every member of the ECP must be able to communicate with each other and to the BDOC, if needed. All ECP posts must have the ability to communicate with friendly units outside the small-base, both verbally and with visual signals. Proper reporting formats and procedures must be standardized. Distress signals should be established for all posts in the ECP, including the overwatch positions. In addition, brevity codes and signals for: "Unit not answering, Reason unknown," "Open fire," "Send the QRF," and "Possible Intel Source" must be established. These brevity codes and signals should be rehearsed daily.

Other ECP communications considerations:

- ☐ Train ECP security force personnel to the lowest level on all communication systems; personnel in ECP overwatch positions may be needed to direct counter-fire or aviation assets to a target on the ground that only they can see
- ☐ Incorporate two nets (primary/secondary) into ECP operations to prevent interruptions of emergency traffic with administrative reporting traffic and radio checks
- ☐ Communicate all administrative traffic via telephone or computer networks
- ☐ Ensure all ECP personnel are able to report quickly and accurately using the standard Size, Activity, Location, Uniform, Time, and Equipment (SALUTE) format

- □ Rehearse communications procedures for ECP contingency/response actions/battle drills

ECP RANDOM OPERATIONAL MEASURES

The small-base leader should implement random operational measures for ECPs in an effort to decrease the ability of the enemy to attack. Similar to random antiterrorism measures, when implemented in a truly random fashion, random operational measures alter the external appearance or security "signature" of an ECP so that the enemy conducting surveillance cannot identify routines and patterns.

Random operational measures provide the following advantages:

- □ Change the security profile surrounding an ECP and convey an external impression of greater vigilance and awareness
- □ Variation in security routines makes it harder for the enemy to identify detailed descriptions of significant routines/procedures or predict movement within the ECP
- □ Increase awareness for ECP security force personnel
- □ May force insurgents to ponder the question "Do they know we are here, and have we been compromised?" and ask, "What is the impact of these new security practices on our ability to achieve our operational goals?"

The impact of random measures is difficult to gauge because these efforts introduce uncertainty for not only planners but also organizers of enemy attacks.

Random operational measures considerations:

- □ Random operational measures are not without cost; implementation will consume ECP security force and other personnel, time, energy, efforts, and resources

- □ To be effective, tenant and transient units must be fully integrated and support the ECP random measures; implementation should not be limited to security force personnel only

- □ To confuse enemy surveillance attempts, random measures should be implemented in a strictly irregular fashion, never using a set time frame or location for a given measure

- □ Random measures should be conducted in coordination with local HN authorities/personnel

At a minimum, small-base leaders should consider moving ECP post positions occasionally under the premise that fixed posts make easy targets for the enemy. Other examples of random operational measures for ECPs include:

- □ Change operating schedules/hours to reduce patterns

- □ Visibly enhance the security profile by increasing number of ECP security personnel

- □ Occasionally move checkpoints and vehicle barriers to reduce the effectiveness of preoperational surveillance by hostile elements

- □ Change search procedures for personnel and vehicles to eliminate routines and predictability

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CHAPTER 5
ECP TECHNOLOGY AND MATERIEL SOLUTIONS

This chapter contains available technology, materiel and equipment solutions for use in ECP development. The technology presented is a representative list of possible technologies and is not all-inclusive. The technologies are limited to those that:

- □ Have been tested or successfully used in the AOR and shown to be effective against common threats encountered in Afghanistan and Iraq
- □ Could be available to small-base sites (availability will be driven by logistics capability; it is assumed that small-bases have limited logistics capability and that some equipment will not be available for a small-base situation)
- □ Require limited construction support for emplacement (availability of heavy construction equipment such as cranes or bulldozers may be limited in Afghanistan)

The selection of technology and material solutions should be based on functionality and the ability to enhance small-base and ECP security and operations. Planning (see PLANNING chapter) and design efforts (see DESIGN chapter) should assist in the selection of solutions.

Technology solutions that were not included in this chapter may be available or volunteered for use at small-base ECPs due to special circumstances. In these instances, the small-base leader should vet "special" or "volunteered" technologies to ensure they are effective, trainable, safe and maintainable.

The technologies and materiel presented are grouped by "ECP Function".

PASSIVE VEHICLE ACCESS CONTROL

Vehicle access control for a small-base ECP can be accomplished using passive vehicle barriers. Methods of passive vehicle access control include:

- □ Sharp 90 degree turns into the ECP from surrounding road network
- □ Traffic circles leading into the ECP
- □ Speed management techniques
- □ Nonlinear, serpentine layout of access/egress lanes
- □ Vehicle channelization, containment, segregation
- □ Rejection/turnaround of unauthorized vehicles

These techniques can be accomplished using vehicle barriers, such as pre-cast concrete barriers (Jersey, Alaska, California, Texas), cabled concrete blocks, earth-filled barriers (HESCOs, metal revetment), cabled steel hedgehogs, berms and ditches. The advantages of earth-filled barriers are their low cost and ability to:

- □ Construct massive walls for blast protection against large VBIEDs
- □ Stop most vehicles
- □ Maintain standoff and defensive perimeter

The most effective small-base ECP design is one that uses a combination of active and passive barriers that are integrated with the surrounding perimeter barrier system.

Selection of passive vehicle barriers should be determined by the barrier's ability to stop or slow down a threat vehicle. General terrain, surface condition, pattern of the roadway (straight or curved) and banking of the roadway are factors that impact the velocity that vehicle can achieve.Speed management techniques (non-linear serpentine lanes and vehicle barriers) should be used in ECPs to lower vehicle speeds.

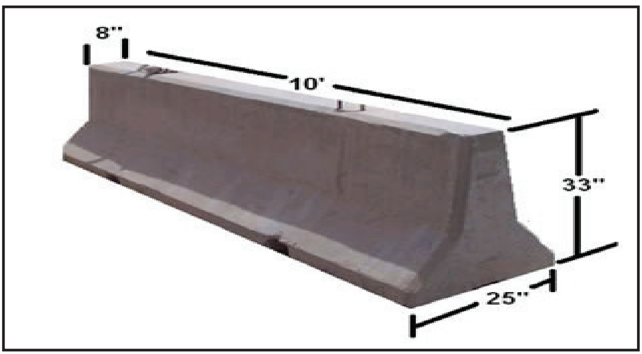
PRECAST CONCRETE BARRIERS

Concrete barriers are the most widely used vehicle barriers and are readily accepted by host nation countries because of their temporary nature. Concrete barriers are typically employed for counter-mobility or explosive blast/fragment mitigation and along avenues of approach. Concrete barriers employed in this fashion can be effective in stopping primary debris if they are sufficiently tall. However, they also may become secondary debris hazards in the immediate vicinity of a large explosion and could cause additional damage. Soil-backed concrete barriers provide better protection against secondary debris hazards (see Figure 3-13). The smaller concrete barriers (Jerseys) are most effective when cabled together with at least a 3/4 in. steel cable; cabling causes a ramming vehicle to push the weight of a wall of concrete barriers instead of a single barrier. If the potential impact angle from a threat vehicle exceeds 30 degrees, then the selected concrete barriers should be anchored to a concrete foundation.

The dimensions and finishing details of the following most popular pre-formed concrete barriers may vary in depending on the barrier fabricator.

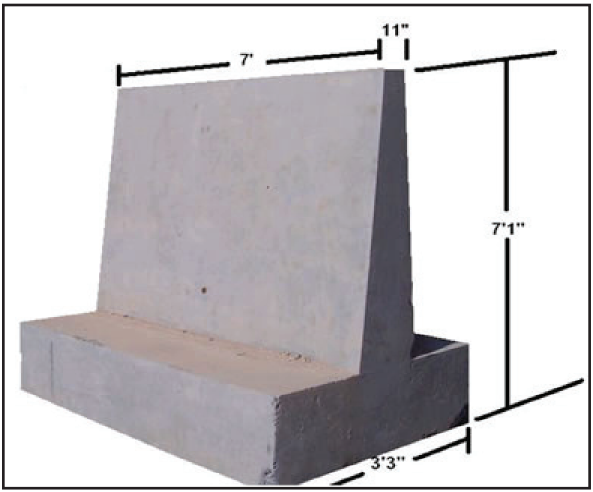
Jersey Barrier

- Transport: MTVR: (6) Barriers; M916 tractor with M870 trailer: (12-16) Barriers; Army HETT: (12-16) Barriers
- Weight =2 Tons; Offload: 25 Ton Crane; Lift: 10 k-Forklift, 10-Ton Crane
- Height = 3’; Bottom Length = 9’10”
- Bottom Width = 2’; Top Width = 10”



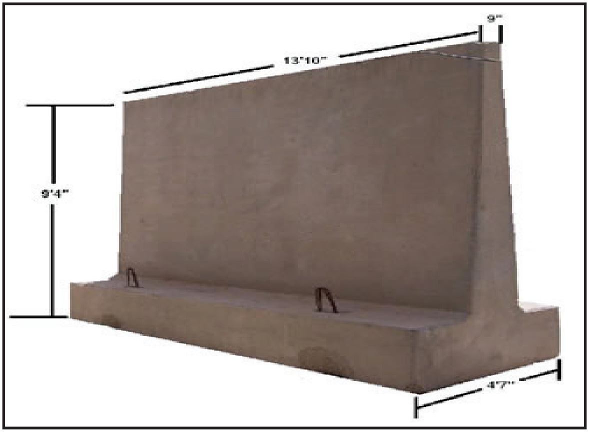
Texas-T (or 7-foot Texas)

- Transport: M916 tractor with M870 trailer: (6) Barriers; Army HETT: (12) Barriers
- Offload: 7 ½ Ton Crane; 25 Ton Crane
- Weight: 10,000 LBs
- Height = 6’8”
- Bottom Length = 6’8”
- Bottom Width = 3’3”
- Top Width = 1’9”
- Weight = 5 Tons
- Lift: 10-Ton Crane, 20-Ton Crane



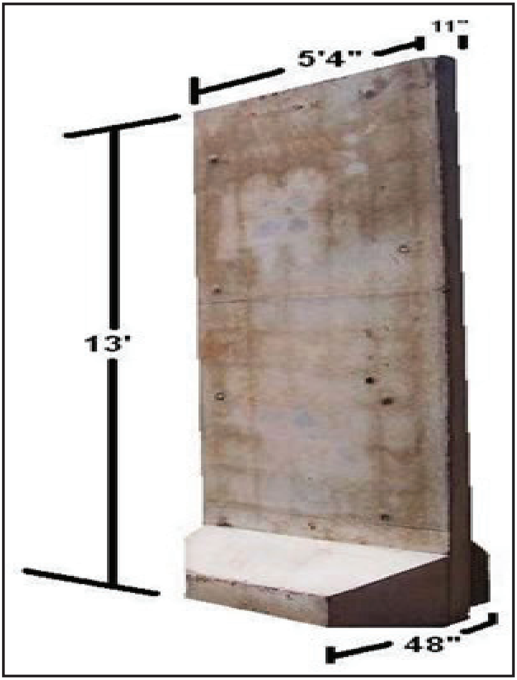
Alaska Barrier

- Transport: M916 tractor; with M870 trailer:(2) Barriers; Army HETT: (4) Barriers
- Weight = 7 Tons; Offload/Lift: 25 Ton Crane
- Height = 10'; Bottom Length = 6' 1"
- Bottom Width = 4'4"; Top Width = 12"



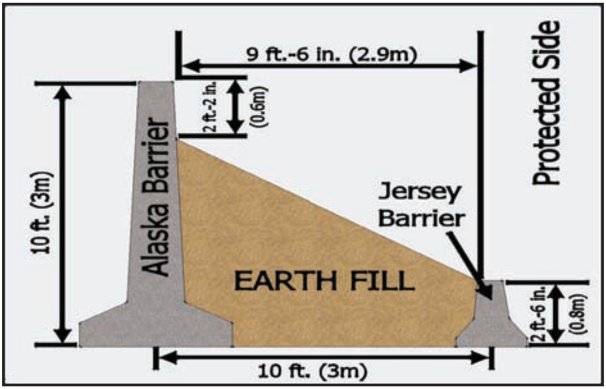
T-Wall

- Transport: M916 tractor with M870 trailer: (4) Barriers; Army HETT: (8) Barriers
- Weight = 6 tons; Offload: 25 Ton Crane; Lift: 10-Ton Crane
- Height = 12'; Bottom Length = 5'
- Bottom Width = 4'; Top Width = 1'3"
- Appropriate for perimeter walls when backed with earth barrier
- Limited blast mitigation under certain conditions



SOIL-BACKED CONCRETE BARRIER ANTI-RAM PERIMETER WALL

If a VBIED explodes close to a concrete wall, part of the wall could disintegrate into shrapnel that could travel hundreds of yards (depending on the size of the device). A soil backing absorbs the shrapnel and normally stops all concrete shrapnel if the earth fill is up to the top of the wall. Increasing the mass of a wall also increases its resistance to a ramming vehicle and keeps it from toppling over. Topping the barrier with wire provides personnel protection. Fill in soil (not rock) between pre-cast concrete barriers, or back concrete barrier with earth filled barriers.



CABLED CONCRETE BLOCKS

Non-reinforced concrete blocks can be used as standoff barriers, to slow vehicles on access roads into the ECP and to form non-linear serpentine lanes. These blocks can be cast in place and should be anchored together with at least a 3/4 in. steel cable so that movement or removal is difficult. Cabled concrete blocks are most effective when placed in a serpentine pattern. Testing has shown that an effective technique to increase vehicle stopping ability is to cable concrete blocks together in a zig-zag configuration as depicted below.

OIL DRUMS FILLED WITH SAND OR CONCRETE

Oil drums (or any large drums/barrels) filled with sand or concrete can be used to form expedient vehicle or personnel barriers. These barriers can be used to slow vehicles but should not be used to stop vehicles unless they are anchored or cabled together because they can be easily moved by vehicles at slow speeds. At higher speeds, vehicles could crash through uncabled filled drums. As a personnel barrier, filled drums could be used as access control lane markers but must be topped with concertina or barbed wire to prevent climbing.

BOLLARDS

Bollards (see Figure 3-18) are metal or concrete columns which are anchored into the ground. Bollards can be used as active or passive barriers. Active bollards can be pulled out of the ground by hand or using construction equipment such as a fork lift or front end loader to control entry at an ECP. An effective passive bollard system consists of 7 ft- (2.1 m) long steel pipes, a minimum of 8 in. to 10 in. in diameter filled with concrete. The pipes should be spaced 2 ft to 4 ft off center and anchored into a 4-ft footing, so they project 3 ft above ground. The footing should be continuous, but individual footing depth should be at least twice the width, and the width should be three times the diameter of the pipe. Bollards can be placed on either the inside or the outside of existing fences. Bollards should never be placed near the unsecured side of existing fences or barriers because they could be used as a climbing aid.

SOIL-FILLED BARRIERS

Soil-filled barriers are typically employed to provide blast and fragment damage protection. These barriers work extremely well for blast fragment protection and are effective as vehicle barriers. Examples of earth-filled barriers include the HESCO bastion concertainers and metal revetments.

- □ Construction equipment such as a front end loader is required to fill soil bins.

- □ Soil bins should be filled with soil/sand and NOT FILLED WITH ROCK. A large explosion close to a soil bin can disperse part of the closest soil bins contents; being hit with soil/sand shrapnel has insignificant effect; being hit with rock could result in casualties/fatalities.

Geo-Textile Lined Wire-Mesh Containers

These barriers are composed of collapsible wire-mesh cells that are lined with a geo-textile fabric that minimizes transportation weight/volume requirements. The geo-composite material is collapsed during transport and expanded and filled during construction. For deployment, the wall sections are expanded, positioned, and filled with available soil or sand with no or a minimum amount of gravel, rock, or concrete rubble since it can form shrapnel in an explosion close to the barrier. The wall sections can be connected to form longer walls, separated to form shorter sections, or stacked to increase wall height.

For use as a vehicle barrier, these barriers are normally built with a two-row-wide base and at least a second level in order to provide sufficient mass to stop a vehicle. Tests by the U.S. Air Force Force Protection Battlelab showed that this design effectively stopped a 15,000 lb truck traveling at 30 mph (see Figure 3-14). Large-sized containers, when constructed as indicated above, provide a significant vehicle barrier.

o-textile lined wire-mesh earth containers are available from a number of manufacturers, but there can be a significant quality difference between each.

Metal/Metalith Revetment

Like the wire-mesh container, these barriers have the capability to minimize transportation weight and volume requirements, while optimizing the provided level of threat protection. During transport the metal material can be collapsed and stacked and upon arrival at the final destination expanded and filled. However, when a metal revetment is damaged, fill material such as sand will continue to leak out, and may require replacement of the damaged section.

- Metal Revetment MR-1. NSN: 5450-01-535-7952
  - Size 4 ft wide x 8 ft high x 64 ft long
  - Pallet size 37” wide x 100” long x 19” high, total weight 4,535 lbs

- Metal Revetment MR-2. NSN: 5450-01-535-7955
  - Size 2 ft wide x 6 ft high x 104 ft long
  - Pallet size 37” wide x 100” long x 19” high, total weight 4,329 lbs

- Metal Revetment MR-3. NSN 5450-01-537-7061
  - Size 4 ft wide x 10 ft high x 48 ft long
  - Pallet size 37” wide x 100” long x 19” high, total weight 4,401 lbs

BlastBloc

BlastBloc was engineered for extended, heavy combat support operations, as a CLASS I expeditionary barrier and CLASS II modular structural load-bearing system. BlastBloc is a soil-filled container made of heavy duty, high-performance ballistic polymers and alloys suitable for temporary or permanent low maintenance construction.

Each BlastBloc package Includes:

- 300 meters of Perimeter Wall (2.5 meters tall, 1.9 meters thick)
- 3 Observation Towers (5 meters tall) with overhead protection
- 4 Guard Posts (3.8 meters by 3.8 meters) with overhead protection
- Additional Blocs for Construction of Vehicle Barriers

BERMS AND DITCHES

Berms and ditches can be used to stop vehicles if the ground conditions will support. Triangular ditches and hillside cuts are easy to construct with the proper heavy construction assets and are very effective against a wide range of vehicle types. Hillside cuts are variations of the triangular ditch adapted to hillside locations and have the same advantages and limitations. A trapezoidal ditch requires more construction time but is more effective in stopping a vehicle. With this type of construction, a vehicle will be trapped when the front end falls into the ditch and the undercarriage is hung up on the leading edge of the ditch, rendering it inoperable (see BARRIER CONCEPTS chapter and Figures 3-9, 3-10, 3-11).

EXPEDIENT BARRIERS

Common construction items, such as large diameter concrete culverts, steel pipes, and large military and construction vehicles (i.e., dump trucks and earth moving equipment) that have heavy mass and size can be used as expedient barriers. If used, these expedient barriers should be stabilized and anchored to prevent displacement by a ramming vehicle.

Examples

□ Three-foot (0.9 m) sections of large-diameter, corrugated metal pipe or reinforced concrete culvert can be placed on end and soil-filled

□ Steel pipe can be stacked and welded together

- Construction or military vehicles can be anchored together with cable or chain; to increase effectiveness, the cable or chain can be anchored to adjacent vehicle barriers such as concrete barriers

- Destroyed or captured enemy vehicles can also be used as expedient vehicle barriers

- Heavy-equipment tires (see Figure 3-26), 7 to 8 ft (2.1 to 2.4 m) in diameter, half-buried in the ground and tamped so they are rigid can be effective vehicle barriers. Buried equipment tires were tested against a 3,350 lb (1,523 kg) vehicle, traveling at 51 mph (82 kph). The vehicle penetrated the barrier 1 ft (0.3 m). The tires were 36 ply with an 8-ft (2.4 m) diameter (2.4 m) and weighed 2,000 lb (909 kg) each.

MODULAR VEHICLE BARRIER

Portable L-shaped barrier, the Modular Vehicle Barrier (MVB), has a high-impact design that transfers a vehicle's horizontal momentum vertically.

- □ Quick assembly; no tools needed
- □ Flexible length, individual units fit together to correspond to varying vehicle and road sizes
- □ Suitable for sandy, rocky, rough terrain, gravel & asphalt
- □ Stops a 2 ½ TON truck traveling at 60mph
- □ Modular design allows assembly of individual barriers in any length desired
- □ Can be set in multiple rows for larger vehicle
- □ (NIPRNET) WEBSITE: http//www.miframesecurity.com/e/mvb.html

CALTROPS

Caltrops are designed to penetrate and deflate tires, and can be used to block off an area for vehicles (and personnel). Box of 100 - 1.25” spikes: NSN: 4240-01-539-1517.

CABLED STEEL HEDGEHOGS

Also known as star barriers, hedgehogs are designed to roll underneath a ramming vehicle and destroy the driveshaft and undercarriage. When cabled to adjacent jersey barriers, they can help stop a vehicle. To be effective, hedgehogs should be of sturdy construction and used on paved areas. Barrier can be fabricated locally in metal working shop.

ACTIVE VEHICLE ACCESS CONTROL

- □ Active vehicle access control includes the following design concepts:
- □ Vehicle speed management
- □ Non-linear serpentine lanes
- □ Intermediate gates
- □ Containment, segregation and channelization of vehicles
- □ Rejection of unauthorized vehicles
- □ Final denial barriers

Active vehicle access control technologies and materials require manpower or electric power to operate. Active vehicle access control systems are typically used for vehicle gates. Gates should be closed when not in use to reduce the possibility of an attacker running the gate. Gates constructed for small bases are frequently manually operated.

An intermediate gate provides access control throughout the ECP. For example, an intermediate gate should be used to limit access into the vehicle search area. An intermediate gate should be capable of stopping a vehicle and providing warning to the security force if an attempt is made to breach the ECP.

A final denial gate or barrier is the last defense against a vehicle penetrating the ECP and accessing the base interior, and should be capable of forcibly stopping a vehicle attempting to ram through.

EXPEDIENT STEEL ROLLING GATE

An expedient steel gate is shown below in the rear of the photo. For maximum vehicle control, the expedient steel gate should be used in conjunction with the expedient pop-up barrier shown in the foreground. This gate can be easily fabricated in a local metal working shop. The expedient steel gate can be used for active personnel access control if a personnel gate or door is designed into the gate.

- Manually operated; wheel rollers run on a track embedded in concrete

- Steel box posts embedded in concrete frame the gate and provide support against ramming

- Widely used but effectiveness against ramming vehicles unknown; constructing a pop-up barrier or single piece box beam gate in conjunction with the steel gate should improve anti-ramming capability

EXPEDIENT POP-UP BARRIER

Barrier can be fabricated locally in metal working shop.

- Manually operated, cantilevered barrier; outbound vehicles roll over the barrier and proceed; inbound vehicles are forced to stop until the barrier is manually lowered

- Steel box posts embedded in concrete frame the gate and provide support against ramming vehicle

EXPEDIENT SINGLE PIECE BOX BEAM GATE

Barrier can be fabricated locally in metal working shop.

- ☐ Best used as a back-up to the steel rolling gate with personnel wire topping to block the vehicle entrance when the doors are opened
- ☐ Manually operated; note the wheel roller
- ☐ Barrier is pinned to the steel plate affixed to the concrete barrier and into the ground when closed
- ☐ Barrier slides through steel plate channel, which is embedded in the concrete surface

EXPEDIENT SWINGING LEAF GATE

Barrier can be fabricated locally in metal working shop.

- ☐ Manually operated swing gate; note the latch in middle of the gate
- ☐ Steel box posts embedded in concrete frame the gate and provide support against ramming vehicle

- A personnel door built into the left leaf of the gate, permits personnel entry without opening the vehicle gate

- Concertina wire installed as a topping prevents climbing

- Widely used but effectiveness against ramming vehicles unknown; adding an expedient single piece box beam gate or pop-up barrier should improve anti-ramming capability

KIT BASED VEHICLE BARRIER (KBVB) SYSTEM

The KBVB is a drop arm type of barrier system designed to operate much like a railroad crossing gate when attached to jersey barriers. The barrier has a weighted counterbalance that allows a single person to manually raise/lower and/or rotate the arm.

- Capable of stopping a 15,000 lb vehicle at 50mph
-
- Requires engineering support for installation
-
- NIPRNET Website: www.barrier1.us

NASATKA BARRIER

Nasatka is a relocatable, mobile vehicle barrier that can be towed and deployed in under 20 minutes, without a requirement for excavation. Its average opening is 12 feet (3.66 meters) to 16 feet (4.88 meters with a height of 3 feet (78.8cm) above the road surface. The barrier is normally operated manually via counter balance without the aid of hydraulics and/ or electrics, although hydraulic operation is an option.

- □ Standalone, non-anchored barrier, capable of stopping 15,000 lb vehicle at 30 MPH.
- □ NIPRNET Website: www.nasatka.com
- □ TAMCN: KL3572 NSN: 5840-01-DTQ-2832

MP5000 MOBILE POP-UP BARRIER

The MP5000 mobile crash barrier can be towed, deploys in 15 minutes and operates locally or remotely. Deployment, retrieval and operation via a battery operated hydraulic power system; stops and disables a 15,000 pound at 30 mph. The MP5000 provides a 16’ clear vehicle traffic opening. The barricade operates at rates between 10 and 15 seconds for a full up-down cycle. Sustained rates of 40 cycles per hour can be maintained indefinitely, depending on the available recharging methods employed. Available in 12 and 16 foot clearings. NSN/Part #: MP5000, www.deltascientific.com

DSC7000 DROP-ARM BARRIER

The DSC7000 is available in hydraulic and manually operated models with clear openings from 10.5 - 20 feet. The DSC7000 is a 725-pound beam vertical lift barricade capable of stopping a 15,000-pound vehicle at 50 mph; NSN/Part #: DSC7000.

DSC7500 SWING BEAM BARRIER

The barricade stops a 15,000-pound vehicle traveling 50 mph. Manual or powered with full automation features. The standard clear opening is 12 ft but is available up to 30 ft. Other versions of the DSC 7500 Series include a full swing gate with anti-climb features. NSN/Part #: DSC7500

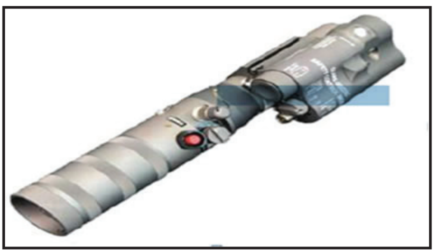
PERSONNEL AND VEHICLE WARNING / SIGNAL

The ECP personnel and vehicle warning/signal is any action used to alert an approaching personnel or vehicles that ECP security personnel are present and to direct actions to halt, slow down, exit the vehicle, etc. This can take the form of hand signals (not included in this product), flashing lights or lasers, and audio equipment such as a bullhorn and automatic language translator.

MK 79 SIGNAL KIT (PEN FLARES)

LASER

A bright, visible laser, in both daytime and nighttime, can be used to signal vehicles and pedestrians.



BULLHORN

This is a hand-held bullhorn-style portable loudspeaker.
NSN: 8465-01-135-8495

VOXTEC PHRASELATOR P2MX-2 TRANSLATION DEVICE, MODEL 2000 WITH FP MODULE

Hand held automatic translator device used to communicate with individuals in their native language in the absence of a translator. NSN/Part #: ASSY-63-0303-01

MAGNETIC AUDIO DEVICE (MAD) ACOUSTIC HAILING DEVICE

The magnetic audio device (MAD) provides directional, high quality verbal challenges and warning tones with effective ranges of 1km+ (depending on conditions). The units also have add-on options such as an MP3 player, which could be pre-loaded with challenges and a range of tones and warnings, a real time automatic translation device which allows for communication worldwide, and others. NSN: 5965-01-568-2627

VEHICLE SEARCH

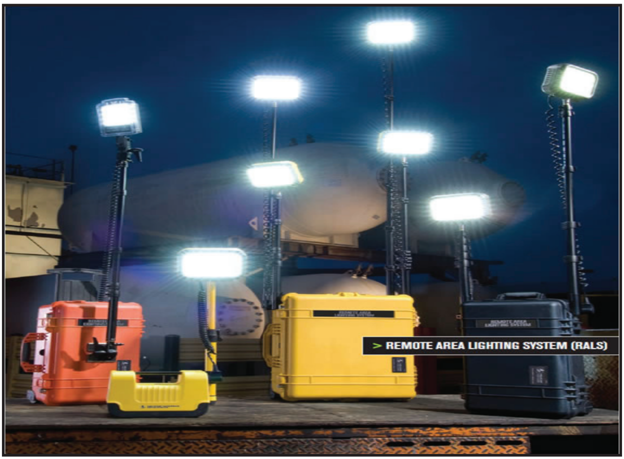
Vehicle search equipment includes cameras, explosive detection sensors, mirrors, lights, inspection wands, etc. Search aids significantly assist in detecting explosives; however, there is a point beyond which additional technology does not provide additional detection capability. Based on Air Force explosive search tests:

- Physical inspections with an under vehicle inspection mirror, and with military working dogs, achieves an 81% detection rate with a 10% false alarm rate

- □ Low cost explosive trace detector technology used with the "traditional approach" achieves a 91-92% detection rate with a 20 or 27% false alarm rate (depending on which particular technology options are used)

REMOTE AREA LIGHTING SYSTEM (RALS)

System employs battery operated, solid-state mounted LEDs in a self-contained case with multistage charger. Low/high brightness of 2,000 to 4,000 lumens and beam spread is 120 degrees.



SEARCH MIRRORS (SAMS/SLAMS/TSM)

Large or small mirrors (lighted or non-lighted) attached to a telescoping rod are available for searching the undercarriage of vehicles. NSN: 5120-01-520-8743

SNAKE EYE CAMERA KIT

A fiber optic cable with battery operated camera and color display used to search hard to reach places, particularly in the undercarriage of vehicles. NIPRNET Website: www.snakeeye.com

INSPECTION WAND (V-1000)

The V-1000 is a 12” long Lumenyte fiber optic wand that emits a bright 360 degree light that can be used for inspecting engine compartments, wheel wells, gasoline tanks, and other spaces where a conventional flashlight fails to provide adequate illumination. NSN: 5820-25-133-1514.

EXPLOSIVE TRACE DETECTOR SPRAY KIT

Kit includes spray bottles, test paper, verification papers used to detect explosive residue or gunpowder on individuals, vehicles, or materials. NSN: 6665-01-554-8014.

ENTRY POINT VEHICLE KIT (EPVK)

The kit contains items for use at controlled vehicle entry points for searching vehicles.

- Includes: Snake Eye Camera Kit, Security Illumination Mat System (SIMS), Security Assessment Mirrors (6 each), Telescoping Search Mirrors (TSM – 2 each), Inspection Wand V-1000 w/ TR-3 rechargeable flashlight (6 each), Inspection Wand V-2000 w/ TR-3 rechargeable flashlight (6 each), LED Flashlights, Lyte Flares, Explosive Detection Spray Kit

- NSN: 6350-01-532-2051

GE MOBILE TRACE (SHERLOCK)

This is a hand-held dual mode explosive trace detection system used to detect explosives and narcotics. NSN/Part #: P0007027 (Unit)

FIDO

The “FIDO” explosive detection system was designed to conduct explosive searches by sampling the air to determine if there are or had been explosives in vehicles, rooms and on persons. System places operator at risk while conducting search. NIPRNET Website: http://gs.flir.com/detection/explosives/fido NSN: 6350-01-DTQ-8171.

PERSONNEL ACCESS CONTROL

The objective of personnel access control is to maintain control of all personnel attempting to gain access to the small-base, to include coalition personnel, visitors and contracted workers. Related technology solutions should assist in this effort by ensuring only authorized personnel enter the small-base. Regardless the type of technology it is important to accomplish the following:

- ☐ Clearly define the access control measures required for the small-base
- ☐ Develop procedures to be followed during the search of persons and for denying access and removing unauthorized persons

To be effective, personnel access control procedures should be designed to increase the amount of time needed to gain access to the small-base to allow ECP security personnel to observe/assess personnel, sound alarms and take immediate protective actions in the event of attack.

Like vehicle access control, personnel access control technologies can be categorized as either passive or active. Passive and active personnel control technologies should be used to construct access lanes that contain and segregate personnel from vehicles and force personnel to proceed through checkpoints and search areas.

Passive personnel control denies personnel access to the small-base without the need for manpower and can be achieved using a variety of barriers. Most barriers used for vehicle access control can also be used for passive personnel access control providing the barrier is topped with concertina or barbed wired to deter personnel from climbing over the barrier.

Passive personnel access control barriers can be defeated by climbing over them, consequently, these barriers must remain under constant observation. In addition, possible hiding places or cover positions for attackers must be eliminated in and around passive personnel access control barriers.

PRECAST CONCRETE BARRIERS (See Passive Vehicle Access Control discussion)

SOIL-BACKED CONCRETE BARRIERS (See Passive Vehicle Access Control discussion)

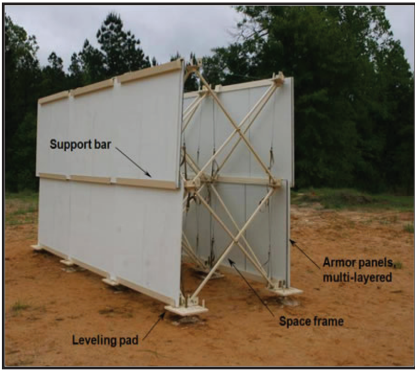
OIL DRUMS FILLED WITH SAND OR CONCRETE (See Passive Vehicle Access Control discussion)

SOIL-FILLED BARRIERS (See Passive Vehicle Access Control discussion)

BERMS AND DITCHES (See Passive Vehicle Access Control discussion)

MODULAR PROTECTIVE SYSTEM (MPS)

A physical protection capability against common threat weapons that is portable, rapidly deployable and recoverable with little or no construction assets.



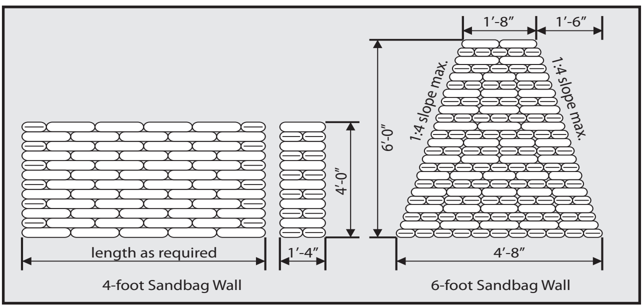
- ☐ Lightweight, man-portable, rapidly emplaced
- ☐ Modular, scalable (tailored protection based on threat), requires no special tools
- ☐ Full protection:
    - Small arms up to 7.62mm, fired at 50 yds
    - 60-mm mortar, Direct contact
    - 82-mm mortar, 5-ft standoff
    - 120-mm mortar, 10-ft standoff
    - HBIED, 10-ft standoff
    - 20-lb C4, 20-ft standoff
    - RPG, 10-ft standoff
- ☐ 99% protection - 122-mm rocket, 15-ft standoff

- MPS Kit NSN: 5410-01-566-6439
  - 16 Armor Panels – NSN 5410-01-555-9995
  - 4 Basic Frames – NSN 5410-01-561-3080
  - 12 Z-Bars – NSN 5410-01-561-3053
  - 4 Leveling Pads – NSN 5410- 01-561-3091

- MPS Starter Kit NSN: 5410-01-566-6493
  - 32 E-Glass 15in x 4ft - No NSN
  - 6 Leveling Pads – NSN 5410-01-561-3091
  - 6 Z-Bars – NSN 5410-01-561-3053
  - 1 Ratchet and 7/8" socket for Leveling Pads

SANDBAG WALL

Sandbag walls topped with concertina wire can be an effective method for personnel access control. To be free-standing, sand bag walls require a sufficiently thick wall, or some type support such as against a structure and tied into rebar driven into the ground.



CHAIN LINK OR METAL MESH FENCE TOPPED WITH WIRE

Chain link fences are cost effective, have a low profile, and readily available. These fences are particularly effective if coupled with other barriers, either man-made (a canal) or natural (a lake or a river). However, chain link fences can be effectively breached by cutting holes through the fence or tearing down the outriggers with a grappling hook and climbing the fence. Fences offer delays of less than 1 min against low-level threats to as little as 3 to 8 sec against trained and dedicated high-level intruder teams. The height [up to 8 ft (2.4 m)] of the fence or the degree of enhancements used has little effect on this time. Metal mesh fences are generally more difficult to climb. These actions can be deterred if the security force tops the fence with outriggers and laces horizontal wire through the fence at the base.

CONCRETE/MASONRY WALL TOPPED WITH WIRE

Concrete and concrete masonry unit (CMU) walls can be effective personnel barriers and can also prevent observation of the base if tall enough, but are costly and take considerable time to build. For walls to be effective, they should be smooth-faced, topped with outriggers and other wire material (razor wire, general purpose tape obstacle (GPTO), barbed concertina wire) and be at least 9 ft tall. While a wall provides more structural support for someone climbing the wall than chain link fence, it provides fewer handholds for the climber. However, explosives can breach a concrete wall.

- ☐ Does not provide protection against blast unless the wall is massively thick
- ☐ CMU walls should be filled with concrete; if not, the walls are susceptible to producing large amounts of shrapnel in an explosion
- ☐ Soil or soil-filled container backing to the walls will absorb concrete shrapnel

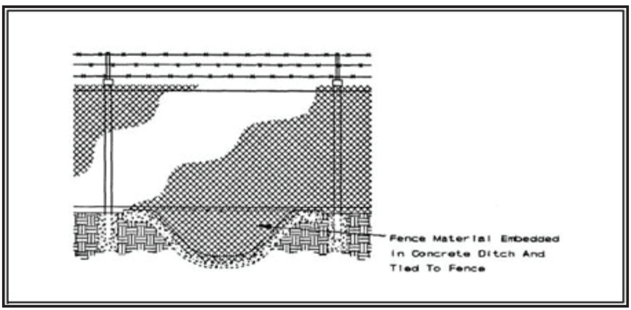
CONCERTINA WIRE/FENCE

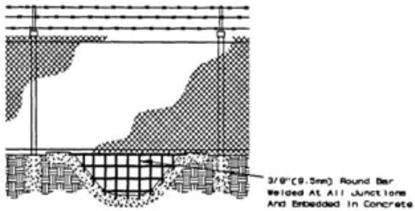
Concertina wire can be used by itself or placed atop barriers to delay enemy personnel attempting to climb over the top of the barrier. NSN: 5660-01-495-6123

Triple-strand concertina fences can be rapidly emplaced by unskilled labor. Triple-strand concertina fences can be breached by an intruder's cutting the wire, disassembling the fence, or flattening down the concertina with a board or similar object. A poorly constructed concertina fence (i.e., one with no horizontal support wire or stakes too far apart) is especially susceptible to the latter two methods.

DRAINAGE CLUVERTS, UTILITY OPENINGS, UNDER FENCE GAPS ANTI-PERSONNEL BARRIERS

Special anti-personnel protective measures must be designed for culverts, storm drains, sewers, air intakes, exhaust tunnels and utility openings that pass through cleared areas, traverse under or through security fences, or have a cross-sectional area of 96 in.2 (0.06 m2) or greater with the smallest dimension being more than 6 in. (150 mm). Such openings and barrier penetrations should be protected by securely fastened grills, locked manhole covers, or other equivalent means that provide security penetration resistance of approximately 2 minutes (see discussion in Chapter 3 – BARRIERS).





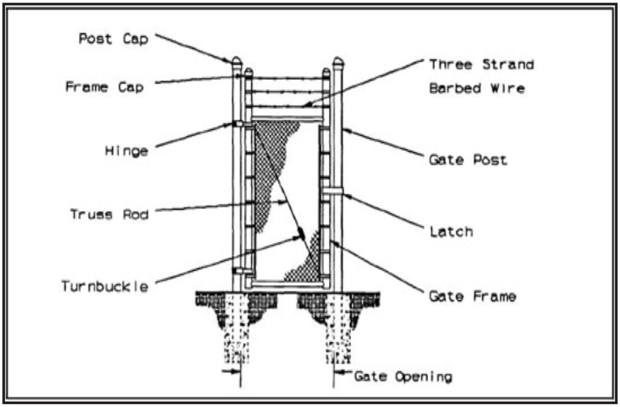
Active personnel control is achieved using equipment and material that requires manpower to operate. This includes a combination of barriers and gates, search equipment, automated tools and sensor systems. Personnel access control for a small-base must include personnel entry gates that are capable of closing off and preventing entrance into the ECP. These active entry gates must provide equivalent security as the adjoining ECP barriers and small-base perimeter barriers. Personnel gates should be designed to permit only one person to approach ECP security personnel at any time. Examples of active personnel access control technologies include the following:

EXPEDIENT SWINGING LEAF GATE (See Active Vehicle Access Control discussion)

EXPEDIENT STEEL ROLLING GATE (See Active Vehicle Access Control discussion)

SINGLE SWING GATE

Swing gates should be designed with a minimum 4ft (1.2m) wide opening by 8ft (2.4m) high plus 1ft (305mm) of three strands of barbed wire on top. The gate opening should not exceed 14ft (4.3m). Gate frames should be constructed from 2in. (51mm) (outer diameter) rails or 2in. square members welded in all corners.



PEREY TURNSTILE TYPE B ROTO-GATE

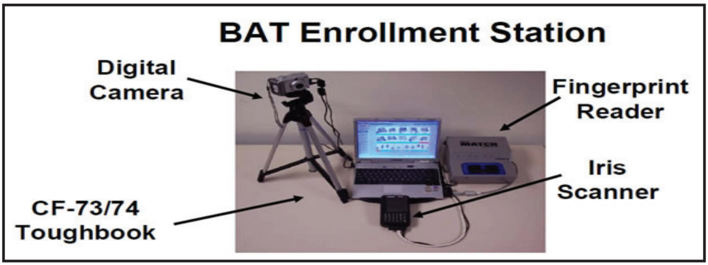
Turnstile gates are used to control pedestrian traffic by reducing pedestrian traffic to a single line rather than a crowd. NSN/Part #: TYPE “B” ROTO GATE

PERSONNEL IDENTIFICATION

Identity verification of entering visitors (including host nation work force) is essential. Personnel checks employ use of identification cards, badging, biometrics scanning, and access rosters to ensure that personnel entering the base are permitted entry and free of possible weapons.

BIOMETRICS AUTOMATED TOOLSET (BAT)

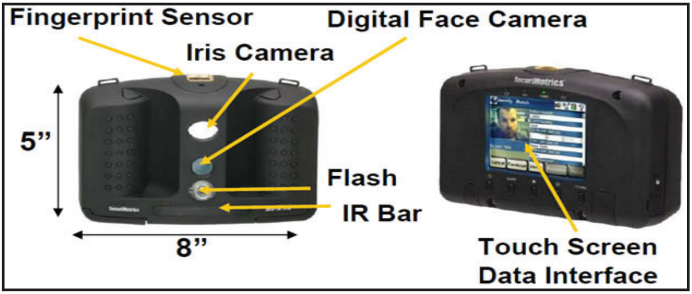
The BAT system is primarily an intelligence gathering and exploitation tool. Its advantage is in removing the anonymity and freedom of movement of insurgents. Biotextual data can be gathered to complete an enrollment.
NSN: 9999-01-531-4667



- ☐ Trained operator collects fingerprints, iris scans, facial photos and biographical information of persons of interest into a searchable data base
- ☐ Used to screen for individuals on Watch Lists
- ☐ Provides repository of intelligence data
- ☐ Can be used to produce an identification badge
- ☐ Office equipment durability; subject to rapid deterioration in austere environments

HANDHELD INTERAGENCY IDENTITY DETECTION EQUIPMENT (HIIDE)

HIIDE is a field capable biometric collection tool used by a trained operator to collect and match fingerprints, iris images, facial photos and biographical contextual data of Persons of Interest against an internal database.



- Lightweight (2lbs, 3 oz), field durable, multimodal collection and matching device
- Interoperable with BAT for biometrics data
- NIPRNET Website: http://www.l1id.com/
- NSN: 5895-01-545-3002

PIER 2.3/2.4

PIER is an iris recognition system for detainee population management, personnel screening, mobile identification, and intelligence analysis. System stores 100,000 to 200,000 records. Device scans an individual iris utilizing an infrared camera and cross match minutia points to an individual for 98% matching accuracy. NIPRNET Website: www.securimetrics.com. NSN: 5855-01-DTQ-2833.

PERSONNEL SEARCH

ECP personnel search technology segregates and isolates individuals, conducts detailed searches and applies final access validation procedures. Males and females should be searched separately, using standard procedures for weapons, weapons parts, and contraband.

GARRETT HAND HELD METAL DETECTER (SUPER SCANNER)

The Garrett SuperScanner is a hand-held metal detector designed to find metal (ferrous, nonferrous and stainless steel) weapons, contraband or other objects carried or concealed on a person. NIPRNET Website: www.garrett.com. NSN: 6350-01-5-205942.

RAPISCAN SECURE 1000

The RapiScan Secure 1000 is a non-intrusive screening system designed to detect metallic and non metallic objects concealed under a person's clothing. It is designed as an alternative to intrusive pat-down searches. NIPRNET Website: www.repiscansystems.com. NSN: 5895-01-531-4671.

RAPISCAN METOR 200WP METAL DETECTOR

The Metor 200WP is an easily moved, fully weatherproof multi-zone, walk-through metal detector for harsh climates. NIPRNET Website: www. rapiscansystems.com

CORAL SD PBIED DETECTION SYSTEM

This optical enhancement device is intended to search personnel for PBIED material. This is an ultra-lightweight, uncooled FLIR that allows for single-handed location and acquisition of close-in targets regardless of cloudy, moonless or other environmentally challenging conditions. It incorporates an eyesafe laser rangefinder, digital magnetic compass and GPS receiver, and performs image processing. NSN No. 5855-01-536-3532

OPAL

The OPAL is a small, lightweight, rugged, man portable, battery operated, tripod mounted, all weather, mid wave infra-red (IR) sight used to detect weapons and bomb vests under suicide bombers clothing. This device is utilized as the first line of defense by the Israeli military against PBIED threats. NIPRNET WEBSITE:http://www.elbitsystems-us.com/. NSN: 5855-01-531-3097

Other technologies that can be used to conduct personnel searches in a small-base ECP include the following items:

EXPLOSIVE TRACE DETECTOR SPRAY KIT (See Vehicle Search discussion)

ENTRY POINT VEHICLE KIT (EPVK) (See Vehicle Search discussion)

GE MOBILE TRACE (SHERLOCK) (See Vehicle Search discussion)

FIDO (See Vehicle Search discussion)

MODULAR PROTECTIVE SYSTEM (MPS) (See Personnel Access Control discussion)

REMOTE AREA LIGHTING SYSTEM (RALS) (See Vehicle Search discussion)

FLOOD LIGHT

This portable floodlight is an extremely powerful lighting system for limited visibility operations. NSN: 6230-01-466-5315.

EXPEDIENT USE OF CONEX

CONEX shipping containers can be locally fabricated for use as a personnel search area. Doors should be cut at both ends, offset from each other. Sidewall and overhead protection could be emplaced as well.

FIGHTING POSITIONS

ECP checkpoints and security post positions should be constructed as fighting positions in order to provide maximum protection. Fighting positions can be constructed using any materials that offer protection against anticipated threat weapons. Most threat weapons are fired horizontally, and the fighting position sides should be able to absorb the weapon impact or blast. Since mortars are a typical threat weapon, fighting positions should have overhead cover to absorb impact and blast.

SOIL-FILLED BARRIERS CONFIGURED AS A FIGHTING POSITION

Important functionality considerations include an ability to protect from common threat weapons (including overhead cover), firing ports, sufficient interior space, and protection from weather.

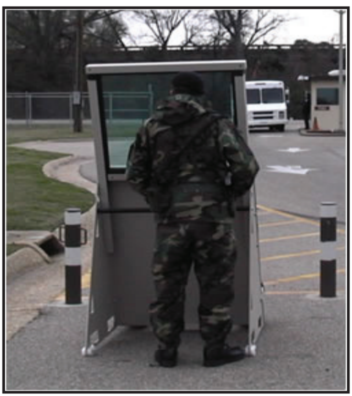
- Single-Bay Aboveground Fighting Position Kit
- Overall Size: 14 ft. long X 8 ft. wide X 6 ft. 6 in high
- NSN: 5680-01-501-1235

- Two-Bay Aboveground Fighting Position Kit
- Overall Size: 14 ft. long X 12 ft. wide X 6 ft. 6 in high
- NSN: 5680-01-501-1357

- □ Aboveground Small Observation Post Kit
- □ Overall Size: 12 ft. long X 8 ft. wide X 8 ft. 6 in high
- □ NSN: 5680-01-501-1462

DefenShield

DefenShield is a mobile defensive fighting position that provides moderate blast protection and can stop 30-06 AP rounds at point blank ranges. Each unit weighs approximately 850lbs. NSN: 1149-01-S01-L268



MCCURDY'S ARMOR GUARD SHACK

McCurdy's Armor™ is a solid, portable, scalable structure that can be used for protection of personnel. McCurdy's Armor™ is a LEGO™ type system that can be assembled quickly into multiple configurations. Components are reusable and can be re-deployed. NSN/Part #: KB410.

BLAST AND AP RESISTANT GUARDHOUSE

The Kontek guardhouse is 10'x10'x8'-10.5" with a 3' 7" door, two gun ports, a split system air conditioner, pre-wired electrical package, and work desk. Weight is approx. 14,000 lbs.

OVERWATCH

Overwatch positions are essentially fighting positions that provide surveillance and crew-served weapons coverage for the entire ECP.

SOIL-FILLED BARRIERS (See Fighting Positions discussion)

EXPEDIENT TOWER/SANGER

German Sanger

British Sanger

NON-LETHAL MUNITIONS

The primary role of non-lethal weapons is to provide a tool for controlling possible threats without the use of lethal force.

40MM BLUNT IMPACT NON-LETHAL MUNITIONS

A variety of non-lethal rounds that use “batons”, foam tips, or rubber pellets which can be used in the M203 to incapacitate perceived threats.

- DODIC/NSN: BA06 1310-01-452-1190, 40mm Sponge Grenade, BA07 1310-01-453-9168, 40mm Rubber
- Baton, BA08 1310-01-453-9154, 40mm Rubber Ball, BA13 1310-01-475-0628, 40mm Crowd Dispersal

40MM SPIN STABILIZED FLASH-BANG PROJECTILE

Used in the M203. Provides a non-lethal loud report and bright flash; rubber tip provides low-fragment velocity. NSN/DODIC: BA24 1310-01-534-8941, 100m

12GA BLUNT IMPACT NON-LETHAL MUNITIONS

Non lethal round used in the Remington 870 or Mossberg 500; a variety of rounds that contain bean bags, rubber bullets, or rubber pellets and which can be used as non-lethal force to incapacitate perceived threats.

- DODIC/NSN: AA29 1305-01-454-0191, 12ga Bean Bag, AA31 1305-01-454-0189, 12ga Rubber, Fin
- Stabilized, AA51 1305-01-470-2405, 12ga Nonlethal Point Control, AA52 1305-01-470-2139, 12ga Crowd

12GA FLASH BANG MUNITIONS

A non-lethal round used in the Remington 870 or Mossberg 500. A 12ga air-burst, flash bang round, available in 100m and 200m variants that provide a 50,000 candle-power flash and 160dB sound. Used as force to incapacitate perceived threats.

- DODIC/NSN: LA51 1370-01-530-6486, for 100m
- DODIC/NSN: LA52 1370-01-530-6571, for 200m

FN-303 WEAPON ATTACHMENT

A compressed-air powered launcher that fires 0.68 cal, non-lethal projectiles. Projectiles types include blunt impact, dye marker, and OC liquid. Effective range is 50m for point targets and 100m for area targets. NSN/Part #: GS-07F-6010P.

LETHAL WEAPONS ADD-ONS

Lethal weapons add-ons are special weapons components beyond those provided with the weapons.

COMMON REMOTE OPERATION WEAPONS SYSTEM (CROWS)

CROWS is a joystick operated weapon system attachment that provides a capability to engage targets from inside a vehicle without exposure to threats such as snipers and IEDs. The system is mounted on a vehicle and integrates the MK19, M2, M240B and the M249 SAW.

TELEPRESENT RAPID AIMING PLATFORM (TRAP)

This system is similar to the CROWS, however the specific site security model is encased to withstand the elements. It is powered by 110v or 220v, and accommodates 7.62 belt-fed ammunition. Used for targeting hostile forces without being exposed.

SNIPER CONTROL

Passive sniper control technologies include surveillance and countersurveillance systems, visual screening of selected areas and gunshot directional sensing to approximately locate active sniper positions
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SOLDIER WEARABLE ACOUSTIC TARGETING SYSTEM (SWATS)

SWATS is an acoustic sensor array system used to determine the origin of hostile fire. It provides the bearing to a shooter with azimuth error <7.5 degrees of actual sniper location with range error of 15% of actual range for targets within 400 meters. The palm-sized, 6.4-ounce sensor can be coupled with an individual operators' interface or used in vehicles and at fixed locations.

BOOMERANG

The Boomerang uses a series of microphones to detect the direction of small arms fire. Boomerang works in extreme weather, in open field and in urban environments, whether static or moving.

SENSORS

Sensors for small-base ECP security and overwatch operations include surveillance and counter-surveillance aids, sensors to assist with vehicle and personnel search, sensors to assist guards in viewing areas under low light conditions, cameras to supplement guard coverage, sensors with day/night capabilities to scan near-to-distant areas and objects from a tower structure, and cameras and mirrors to aid in inspecting difficult-to-access locations.

MEDIUM RANGE, LIGHTWEIGHT THERMAL BINOCULARS

Thermal binoculars can be used for surveillance and counter-surveillance.
NSN 5855-01-536-8145

MIRAGE 1200

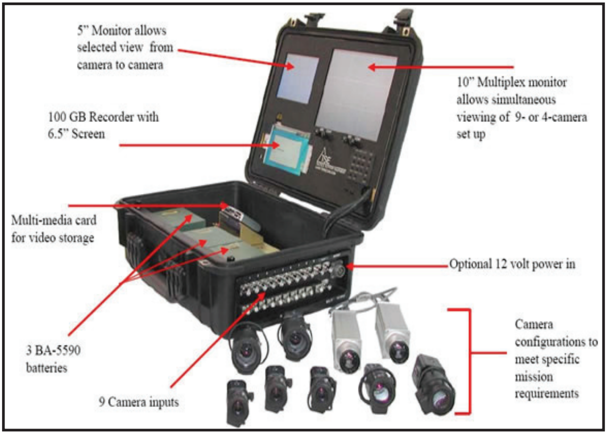
MIRAGE 1200 optical sensor is designed to aid in identifying and ranging suspect optical devices. Device can be used day or night monitoring in all lighting conditions. This unit is a second generation optical sensor utilizing optical retro-reflection in conjunction with an active, eye safe, laser illumination source. MIRAGE is effective up to 1,200 meters regardless of the principle of the targets operation (passive, active, laser, thermal vision and other systems), the level of light, or the time of day. NIPRNET Website: www.brandes-assoc.com.

M24 BINOCULARS

Military issued optics that could be used for surveillance or countersurveillance

MOBILE SECURITY KIT

The Mobile Security Kit is a lightweight, portable, multi-camera security system that allows the operation of day/night, IR or thermal cameras.



- ◻ 3 LCD monitors – 10.5 inches for display
- ◻ Selectable simultaneous display of 4 or 9 cameras
- ◻ Stores up to 150 hrs of full motion video
- ◻ Optional Digital Video Recording (DVR) output
- ◻ Can be operated with hardwire twisted pair, or fiber transmitters, or wireless using video transmitter / microwave configuration

REMOTE DIGITAL IMAGERY SURVEILLANCE SYSTEM (RDISS)

This is also known as the Rapid Deployment Integrated Surveillance System.

The RDISS is an easily deployed surveillance system which provides close-in surveillance of the ECP and areas such as dead spaces close to the ECP. RDISS can be monitored inside the TOC. The system can provide input to the Base Expeditionary Targeting and Surveillance Sensors-Combined (BETSS-C) system which is presented in this section. System includes fixed and pan-tilt-zoom (PTZ) cameras. NSN: 6710-01-C05-1215.

FORCE PROTECTION SYSTEM (FPS)

FPS is a family of sensor systems that is rapidly deployable, easily transportable, and quickly re-locatable. This integrated electronic security system can enhance hasty and fixed site ECP operations. The system can be tailored for a wide variety of semi-permanent, portable, and covert applications. FPS can be used to detect intrusions into protected areas. Like the RDISS, the FPS system can provide input to the Base Expeditionary Targeting and Surveillance Sensors-Combined (BETSS-C) system.

MK-880 LONG RANGE NIGHT VISION SCOPE

The MK-880 (Star-Tron) long-range 170mm objective night vision lens offers 6.5 x magnifications in the most demanding low light level applications. The lens adapts to a variety of NVDs using 18mm or 25mm image tubes. Viewing ranges are at full moon illumination are 6,000 meters and a starlight illumination 2,000 meters. NSN: 5855-01-DTQ-2833.

BASE EXPEDITIONARY TARGETING & SURVEILLANCE SENSORS-COMBINED (BETSS-C)

BETSS-C is a combination of ISR, battle command, and FP systems (Rapid Aerostat Initial Deployment (RAID) Towers, Cerberus Towers (CERBERUS), the Force Protection Suite (FPS), and the Rapid Deployment Surveillance Security System (RDISS).

RAID and CERBERUS are useful for detection of people and vehicles using persistent day and night targeting and surveillance data. The FP suite of systems (a family of cameras integrated into a common operational picture) addresses persistent surveillance and standoff detection needs. Finally, the RDISS suite of systems (a suite of sensors for perimeter and entry point security) addresses security monitoring and surveillance needs. The BETSS-C software, called Terra Sight, accepts the video, images and other information from sensors on towers, UAVs and ground sensors and builds a digital map display.

Rapid Aerostat Initial Deployment (RAID) Tower

The system consists of three main components: elevated platform, multi-spectral sensor suite, and ground control station. The elevated platform is a mast of either 80 or 107ft, depending on specific operational requirements. The multispectral sensor suite consists of a mechanically stabilized, Electro Optic/Infrared (EO/IR) sensor. The sensor consists of an EO color daytime camera, an IR black and white day or night camera, spotter scope and Laser Range Finder (LRF) with Laser Illuminator. The LRF, with pointing azimuth, can precisely locate targets of interest. RAID detects persons at 13km; detects vehicles at 20km.

Cerberus

Cerberus employs an array of detection sensors such as Ground Surveillance Radar (GSR), Video Motion Detection (VMD), and Unattended Ground Sensors (UGS), all self contained on a single mobile platform and optimized for targeting and long range surveillance. All data is transmitted by wireless link to a command and control display. The PTZ cameras are cued by the detection sensor and slew to the alarms.

FLIR RECON III BINOCULARS

The Recon III Thermal Binocular is a waterproof, battery-operated, high performance thermal imager system, capable of continuous operation during mounted and dismounted missions as well as in guard positions. NIPRNET Website: www.flir.com.

FLIR MILRECON CAM

MILCAM Recon is a rugged, 2.5Kg, short to medium range handheld thermal imager that can be mounted on weapons systems. Pierces smoke, dust, battlefield obscurants, and degraded weather conditions with dual field-of-view 50/250mm optic. Its multi-kilometer range makes it ideal for a variety of standoff viewing applications. NSN: 5855-01-DTQ-2834.

POLE CAM

Color and IR illuminated pole camera for tactical and search operations. Device can be used to view and identify threats in a wide range of light conditions and enables user to view around corners, over walls, under vehicles, and around obstructions. NSN: 6720-01-DTQ-0137.

PERSONNEL ALERTING

A personnel alerting capability is required to alert ECP security personnel, overwatch positions, and base personnel about an attack or emergency.

MULTI-SPEAKER PA SYSTEM

System is also known as The SOUNDCOMMANDER® 3500. This is a Giant Voice / Multi-Speaker System that projects high power, long range clear voice audio over an area encompassing a 360° of coverage. The system is designed for operation from a command desk in a temporary or permanent compound.

In case of external power failure, the internal battery backup system will operate the system continuously for approximately four additional hours. System includes built-in three-tone siren with wail yelp, horn and push-to-talk microphone, five 60 watt reentrant horn loudspeakers

BIG VOICE

The Big Voice is a mass notification system designed for alerting personnel to emergency situations, or for general notifications. Systems can be linked in tandem to cover large areas. The system can be fixed or mobile, remotely operated, powered by AC, solar panel, or gas/diesel generator on a transport trailer that is part of the mobile system. NSN: 5830-01-D00-0002

- ☐ Broadcasts highly intelligible live and recorded voice, tone and siren announcements over large geographic areas (approximately 1,500 feet)

- ☐ Remote operation from the WAVES base station, third party control stations or locally from the MSA unit via built-in microphone and control panel.

- ☐ Emergency operation during power outages
- ☐ Allows recording, storage and playback of local messages
- ☐ Rapid field setup; deployable within minutes
- ☐ Weather resistant - special aluminum alloy horn construction provides long service life without material fatigue

CHAPTER 6
ECP TOOLS

The electronic version of the ECP Guide has several tools in the form of checklists, worksheets, smart cards, templates, etc. to help plan, design and operate a small-base ECP. The following are example checklists for ECP site selection, vulnerability assessment, risk assessment, design and construction. Site-specific information filled out in these checklists, that identify small-base capabilities and deficiencies, may result in a classified document that must be protected accordingly.

ECP SITE SELECTION CHECKLIST

Site selection for a new small base should consider the potential location and layout of the ECP to provide as much protection as possible from a potential enemy attack. The following checklist is taken from the tabular form that is available as a MS Word document in the electronic version of the ECP Guide. The checklist should be tailored for each small-base by modifying or adding to the questions. A "NO" answer to one or more of the questions marked with an asterisk "(*)" means the site has a major deficiency and that another site should be considered. "NO" answers to other questions mean minor to moderate deficiencies exist but there may be a way to mitigate the deficiency through proper planning, design and operation of the ECP.

General Information

- □ Date of assessment
- □ Location of proposed site
- □ Border site (Yes, No)
- □ Rank, name, unit of individual completing checklist

- ☐ Planned number of personnel at site
    - US (soldiers and civilians)
    - Coalition (excluding US personnel)
    - Local nationals that work at site
- ☐ Closest village/town & population estimate
- ☐ Estimate number of vehicles that will enter site daily
- ☐ Estimate number of personnel that will enter daily
- ☐ Estimate medivac response time for site
- ☐ Estimate CAS & QRF response time for site
- ☐ Is potential site "land locked" during winter season?
- ☐ Would potential site be only resupplied and supported via rotor wing assets?

ECP Site Selection Checklist

1. (*) Is the site on high terrain away from densely populated areas? This is the best solution since it will make the other ECP site considerations easier to achieve.

2. (*) Is the proposed site and terrain suitable for establishing the ECP functional zones (Approach, Access Control, and Response)? For example, is there enough space for a vehicle parking area, separate personnel and vehicle lanes, a serpentine approach, vehicle barriers and gates, fighting positions, search areas and overwatch position? Not all of these may be needed depending on the threat to the ECP and ECP operations. For example, a small base may consider not

allowing any vehicles inside the perimeter. Instead, provide protected parking as part of the ECP layout.

3. (*) Is there enough space to provide defense-in-depth by providing standoff and obstacles so that ECP personnel have sufficient time to detect, warn, assess, deny and defeat attackers? Standoff should provide ECP personnel the space to increase assessment and reaction time to detect and respond to a threat.

4. Can the ECP be located away from potential enemy vantage points? The intent is to prevent both enemy surveillance of ECP procedures and an enemy sniper threat.

5. Is sufficient standoff available to provide blast protection from the ECP to critical assets inside the base? The best technique to reduce the risks and effects of an enemy attack is to keep the attack as far away as possible so that if an IED were to detonate inside the ECP, the blast would not take out the housing area, dining facility or other high value target.

6. Could the ECP be located on terrain that provides a line of site advantage to ECP personnel versus giving the enemy an advantage? For example, terrain that has a gentle rise from the initial approach to the final entry to the base will provide ECP personnel a clear view of arriving vehicles and personnel to help assess potential threats.

7. Do the terrain and any surrounding roadways prevent a direct high speed vehicle approach to the ECP by eliminating or reducing straight-line access from local entry/access roads? If not, then traffic control barriers may need to be employed on the roads approaching the ECP to slow vehicle down enough so that barriers in the ECP can stop a VBIED.

8. Does the ECP approach have enough space to redirect and turn-around unauthorized vehicles?

9. Does the proposed ECP site have enough space to construct an external parking lot for unauthorized vehicles?

10. Are soil conditions suitable for establishing a vehicular entrance at the ECP with a serpentine approach that will remain passable to heavy vehicle traffic (little to no rutting or uneven surfaces)? If not, is construction equipment and material (grader, compactor, water truck, and gravel) available to properly prepare and maintain the road surface?

11. Are equipment and materials needed for construction of the ECP available and capable of accessing the proposed site? Lack of proper equipment and materials will affect the design of the ECP and the amount of protection it provides.

12. Could a clear zone be established around the ECP to detect and engage attackers? Can hiding places/potential cover for attackers be eliminated in and around the ECP?

13. Is the site suitable for a separate bulk/commercial delivery ECP or transfer yard (preferred) with sufficient standoff from critical assets?

14. Is reliable and sufficient electric power available locally at the site for ECP operations? If generators will be used exclusively, this question is N/A.

15. Does the proposed ECP site have enough space to accommodate an increase in ECP capacity, changes in mission/operations of the small-base or ECP and the implementation of random operational measures?

EXISTING ECP VULNERABILITY ASSESSMENT

Identifying vulnerabilities is the first step in strengthening an existing ECP's force protection posture. ECP vulnerabilities are identified as either procedural or programmatic. Procedural vulnerabilities are due to inadequate or non-existent operational procedures or personnel not following procedures due to insufficient training. They can be mitigated by changing or adopting new procedures and ensuring personnel are trained. Programmatic vulnerabilities are those caused by inadequate ECP design features or the lack of proper material, equipment, and personnel. Programmatic vulnerabilities can be mitigated through design changes and procurement of equipment and material.

The following checklist is taken from the tabular form that is available as a MS Word document in the electronic version of the ECP Guide. The purpose is to help identify, quantify, and prioritize vulnerabilities of a small base ECP. The checklist does not cover all possible issues or situations and should be tailored to your specific ECP site to enhance its capability by modifying or adding to the questions. A "NO" answer to one or more of the questions marked with an asterisk "(*)" means the ECP has a major deficiency that degrades ECP operations or if not fixed could cause loss of life to ECP and other personnel and major damage to the ECP. "NO" answers to other questions mean minor to moderate deficiencies exist that do not degrade ECP operations or that can be mitigated within 72 hrs of the assessment.

After completion of the checklist, the team should summarize its findings to include recording major concerns, whether they are programmatic or procedural and recommending potential mitigation measures.

General Information

- ☐ Date of assessment
- ☐ Location

- ☐ Border site (Yes, No)
- ☐ Unit in charge of security
- ☐ Unit ATO
- ☐ Assessment Team Lead (Rank, Name)
- ☐ Planned number of personnel at site
  - US (soldiers and civilians)
  - Coalition (excluding US personnel)
  - Local nationals that work at site
- ☐ Closest village/town & population estimate
- ☐ Estimate number of vehicles that enter site daily
- ☐ Estimate number of personnel that enter site daily
- ☐ Medivac response time
- ☐ CAS & QRF response time
- ☐ Is site "land locked" during winter season?
- ☐ Is site only resupplied and supported via rotor wing assets?

Existing ECP Plans/Procedures

1. (*) Does the small-base ECP plan address the following elements?

   - Terrorism threat assessment
   - Vulnerability assessment
   - Risk assessment
   - Exercises/drills (i.e. EOF, IDF attack, VBIED, PBIED, sniper, complex attack)

2. (*) Has a recent vulnerability/risk assessment been completed for the ECP? Have deficiencies been corrected or alternate COA's to reduce risk been implemented? If not are there plans for correcting deficiencies and improving the ECP?

3. Does the small-base leader continuously reassess the threat and vulnerabilities of the ECP and consider ways to improve operations and harden the ECP?

4. (*) Are there enough personnel available to man and operate the ECP?

5. (*) Has the small-base leader designated what units (to include tenants) are responsible for ECP operations?

6. (*) Are ECP SOP, ROE and EOF procedures available and are they trained/rehearsed and understood by ECP personnel?

7. (*) Are search procedures for vehicles/personnel adequate? Is there adequate overwatch provided for the guards when searching?

8. (*) Are surveillance and counter-surveillance activities built into the ECP operations?

9. Is all available and applicable technology and equipment being fully utilized within the ECP as a force/defense multiplier? Examples include: X-ray machines, metal detectors, biometric equipment, cameras, and translator devices.

10. (*) Are personnel separated from their vehicles and prevented from viewing vehicle search procedures?

11. (*) Are all barriers kept in the "closed" position until personnel and vehicles are cleared?

12. If available, are biometrics fully utilized to enroll all LNs and checked daily?

13. (*) Are personnel and vehicle search procedures being conducted correctly?

14. Have personnel received cultural awareness training or its equivalent in order to work better with the local culture?

15. (*) Is updated/modified threat information transmitted in a timely manner to ECP personnel?

16. (*) Do ECP personnel have adequate weapons for defending the ECP?

17. Is there an overwatch that provides observation and the ability to employ deadly force against vehicles that attempt to bypass, ram, or otherwise run through an ECP? Is the overwatch equipped with a weapon such as an M240 or M2 machine gun that can stop a vehicle by disabling it or killing the driver?

18. (*) Does the ECP SOP identify hiding places and vantage points that could be used by the enemy prior to and during an attack? Are there plans or procedures for eliminating or monitoring these locations?

19. (*) Are local contractors searched before entering the base? Are they escorted at all times by security forces or other DoD personnel while onsite?

20. (*) Are solid waste and liquid waste (sewage) disposal contractors denied entry to the base? If allowed entry, are procedures (such as a cool-down yard) in place?

21. Does the ECP provide warnings/guidance to persons entering the ECP?

22. (*) Are guards able to slow down and maintain positive control of the traffic flow through the ECP?

23. (*) Have no fire areas been designated to protect civilians, prevent disruption of operations, and protect returning patrols been designated?

24. (*) Are procedures adequate for detecting personnel wearing or carrying improvised explosive devices (IEDs) in packages?

25. Are military working dogs available for explosive detection at the ECP?

26. (*) Do you have procedures for dealing with a situation where a suspected IED is discovered (vehicle or person)?

27. Are translator services available to communicate with workers and LNs?

28. (*) Are private vehicles denied entry to the base? If allowed, are they thoroughly searched, escorted and allowed only in controlled visitor parking with sufficient standoff?

29. Are guards using search equipment when searching vehicles? Is the equipment adequate? Examples: Mirrors, ladder lights, ramps, mechanic's creepers, etc.

30. (*) Are vehicle occupants placed in a holding area that does not protect them from an explosion, where they cannot observe vehicle search procedures, and where they are kept under constant observation by an armed guard not involved in searching the vehicle?

31. (*) Are measures in place (permanent and procedural) to minimize casualties and damage if a SVBIED driver is detected or delayed or loses his/her nerve, and detonates?

32. Is the HN role in ECP operations well defined? Are established control areas coordinated with HN to minimize interference, misunderstandings, and collateral damage?

33. Are C4ISR assets in place to support the ECP?

34. Do ECP personnel use a duress code for emergencies?

35. Are mass notification systems used and are procedures adequate?

36. Is there an EOD team on the site? If not, who will handle EOD issues that arise?

37. Does the site have its own fire-fighting/emergency personnel and equipment for post-attack incident response and consequence management?

38. (*) Is a random operational measure plan available and is it implemented to keep the enemy guessing?

39. (*) Are visitors denied entry to the base? If allowed, are they and their parcels inspected? Are they escorted while on the base?

40. (*) Is a visible identification system established to distinguish contractors, residents, and visitors?

41. Are identification badges reissued periodically with recognizable changes to prevent counterfeiting or duplication? Note: badges should be re-issued every 365 days or sooner if necessary.

42. Are badge logs and an access control roster maintained and identification badges inventoried at least every 24 hours? Are HN forces accounted for on the access control roster?

43. Are ECP battle drills formulated and practiced periodically?

44. Is there a guard service that supplements the ECP? If so, what is the guard rotation plan? Number of shifts? Number of guards per shift?

45. (*) Is there a quick reaction force? If so, what is the QRF response time? How often does the QRF exercise ECP support ops? What is the composition of the QRF (size)? What type of weapons does the QRF have? How far from the facility is the QRF located?

46. (*) Is there a dedicated and effective communication system for ECP personnel (military, HN and contract) that is integrated into the base defense communications system? Is the ECP communication system capable of transmitting instructions to all key ECP posts simultaneously in a rapid and timely manner? Do ECP personnel have sufficient communications equipment?

Existing ECP Location, Design and Layout

1. (*) Are ECPs configured to provide an identification checkpoint, search area, exit, and overwatch?

2. Does the ECP have speed mitigation measures?

3. Are active barriers such as drop arm gates integrated with the surrounding perimeter barrier system?

4. Are active barriers located so as to slow and maintain control of traffic? Are they capable of stopping a ramming vehicle?

5. Are separate ECPs or lanes for trucks and cars used to allow each ECP or lane to serve specific vehicles?

6. Is a parking area at least 350 feet from inhabited areas provided for vehicles that cannot enter the installation/facility?

7. Are berms, sandbagged walls 7 foot tall, or earth-filled containers placed around the vehicle search area to protect nearby personnel from fragmentation should a bomb-laden vehicle explode while being searched?

8. Are berms, camouflage netting, ISO containers or other types of screening used to obstruct observation of the vehicle and personnel search areas from personnel outside the installation?

9. (*) Is there a manned overwatch position for the ECP that can observe all ECP operations? Is it protected against blast?

10. Is there a fuel transfer point outside the perimeter to eliminate potential undetected IED in fuel trucks entering the facility?

11. Are separate secured female search areas provided with overwatch?

12. Is the ECP located on terrain that provides a line-of-site advantage to ECP personnel versus giving the enemy an advantage?

13. In urban areas, is the ECP located away from nearby high-rise buildings that can provide easy observation of the ECP?

14. Is the ECP integrated into the base perimeter security system?

15. (*) Does layout of the ECP conform to the concept of defense-in-depth and allow for security forces to detect, warn, assess, deny and defeat attackers?

16. Have the ECP functional zones been identified and marked on a map or image of the site?

17. Is construction equipment needed to maintain and construct improvements to the ECP available?

18. Is off-street secure parking available?

19. (*) Are there sufficient and effective traffic barriers for traffic control, inspection, and entry control?

20. Has a separate truck/bulk/commercial delivery ECP been established? Is there a “cool-down” yard?

21. Has the placement of ECP-related equipment been noted on a map or image? (barriers, fighting positions, search areas, watch towers, etc.)

22. Do physical barriers used throughout the ECP optimize the use of security forces?

23. Have the locations for sensor systems/intrusion detection systems, etc. that support the ECP been identified and marked on maps/imagery?

24. (*) Is sufficient standoff for blast protection provided from the ECP to the critical assets?

25. (*) Is a clear zone maintained around the ECP that allows security personnel to detect attackers?

26. (*) Are protected fighting positions and/or bunkers provided in the ECP?

27. Has the ECP non lethal/lethal force engagement lines been clearly marked?

28. Is there sufficient lighting and have lighted areas been identified and noted on a map or image?

29. (*) Are high speed approaches by civilian vehicles on the surrounding roadways or terrain prevented?

30. (*) Is the ECP configured so attackers cannot run the entrance or exit lanes?

31. Are standoff measures in place to keep unauthorized vehicles away from the ECP, and is the distance sufficient?

32. Have warning and other types of compliance signs been placed throughout the ECP?

33. Is enough electrical power to operate all portions of the ECP without interruption available? Is emergency power backup available?

NEW ECP DESIGN CHECKLIST

This checklist is taken from the tabular form that is available as a MS Word document in the electronic version of the ECP Guide. The purpose of this checklist is to assist the small-base leader in designing a new ECP that both adequately controls access and maintains the force protection measures of the small-base. In order to achieve these objectives small-base leaders must consider the many influences on ECP design and must identify ECP protection requirements early in the design process. While the concepts and considerations are common to small-base ECPs, no two ECPs are the same therefore the guidance provided in the checklist must be adapted and tailored to the specific needs of each small-base.

General Information

- □ Date of design, rank/name of designer
- □ Name of small-base, location
- □ Estimate number of vehicles that will enter ECP daily
- □ Estimate number of personnel that will enter ECP daily

Design Checklist

1. How does the small-base mission affect the ECP design?
2. What type of access will the ECP control? Vehicles, personnel or both? Coalition personnel, HN military personnel, LNs?
3. Is the number of ECPs limited? Does the small-base require only primary and alternate (emergency) ECPs?
4. How do current and future specific identified threats affect the ECP design? Have these specific threats been considered in the design?

5. How do terrain constraints affect the ECP design?

6. Does the ECP design take advantage of natural terrain features?

7. How does host nation or political constraints affect the ECP design? What impact will the ECP have on local traffic? Will the ECP cause LNs to be inconvenienced? Will the ECP restrict movement of LNs? Will construction of the ECP require use of private land?

8. Do higher headquarters regulations impact the small-base ECP design? If so, how?

9. How does the availability of logistics support and construction materials affect the ECP design?

10. Does the ECP design integrate into and with the small-base perimeter security system?

11. Is the ECP designed to maximize the flow of authorized vehicles and eliminate undue delays and congestion?

12. Does the ECP design maximize the use of available space to provide as much open space/clear zone as possible?

13. What is the estimated number of available security personnel to operate the ECP? How does this number affect the design?

14. Does the ECP design consider the integration of HN security personnel? If so, how?

15. Does the ECP design incorporate the ability to implement random operational measures to reduce predictability of ECP operations and layout? Can barriers and obstacles be moved to vary traffic patterns?

16. Does the ECP design incorporate the use of available technology?

17. Does the ECP design maintain a layered defense-in-depth concept for the small-base?

18. Does the ECP design maximize standoff distances to reduce the risks and effects of an enemy attack and provide security personnel the space to increase assessment and reaction time?

19. Is straight-line access from local entry/access roads eliminated or reduced in the ECP design? Does the design include the use of sharp 90 degree turns, vehicle barriers to block straight-line avenues of approach and traffic circles to slow traffic?

20. Are non-linear serpentine layouts and speed management techniques used in the design? Do examples of speed management techniques include: "s" curves, serpentine lanes, sharp 90 degree turns, speed bumps and tables?

21. Are vehicle barriers spaced at the recommended distances along access lanes to slow vehicles to 10mph or less?

22. Have movable vehicle barriers been included in the design for the entrance to the ECP? Are they capable of stopping a ramming vehicle?

23. Have vehicle barriers been used throughout the ECP to form the walls and lanes of the ECP? Are they capable of stopping a ramming vehicle?

24. Does the design maximize protection for ECP security personnel? Have hardened fighting positions been included in the design?

25. Does the ECP design include a parking/transfer yard for authorized vehicles? Is the vehicle parking/transfer yard under continuous observation and covered by fires from guard towers/overwatch positions?

26. Does the vehicle parking/transfer yard include a space to conduct vehicle searches, if required?

27. Does the ECP design contain, segregate and channelize vehicle and pedestrian traffic? Is a combination of passive and active barriers used to accomplish these objectives?

28. Does the design accommodate oversized vehicles that may need to enter/exit the ECP?

29. Does the ECP design provide various techniques to maintain positive access control of vehicles?

30. Are multiple vehicle turn-around and rejection areas included in the design?

31. Are exclusive and separate inspection/search areas included in the design for vehicles and pedestrians?

32. Are surveillance and counter-surveillance activities designed into the ECP?

33. Has adequate overwatch positions been designed into the ECP? Are search areas covered adequately by overwatch positions? Do overwatch positions have a hardened design to protect against explosive blasts and snipers?

34. Has a space been designed for an external parking lot for unauthorized vehicles? Is the parking area at least 350 feet from inhabited areas?

35. Does the ECP design eliminate natural or man-made vantage points? Are obscuration/screening methods incorporated into the design?

36. Does the design eliminate potential enemy hiding places or cover positions?

37. Does the design include security lighting measures?

38. Does the design incorporate sufficient signage that is clear, concise and easy to read? Does the signage specify access control requirements?

39. Do ECP exit points maintain access control measures to prevent attackers from entering the ECP by simply going against the flow of traffic?

40. Does the design include a location to segregate personnel from their vehicles and prevent the observation of vehicle search procedures?

41. Does the ECP design force barriers to be kept in the "closed" position until personnel and vehicles are cleared?

42. Does the ECP design incorporate adequate communications equipment? Is there a mass notification system used in the design? Is the system integrated into the base defense communications system/network?

43. Does the ECP design include measures such as taller barriers to minimize casualties and damage if an explosive device is detonated (vehicle/pedestrian)? For example are berms or earth-filled containers placed around the vehicle search area to protect nearby personnel from fragmentation should a bomb-laden vehicle explode while being searched?

44. Are berms, camouflage netting, taller barriers or other types of screening used to obstruct observation of the vehicle and personnel search areas from personnel outside the small-base?

45. Has a fuel transfer point outside the perimeter been considered in the design to eliminate potential undetected IED in fuel trucks entering the small-base?

46. Is the ECP located on terrain that provides a line of site advantage to ECP personnel versus giving the enemy an advantage?

47. In urban areas, is the ECP located away from nearby high-rise buildings that can provide easy observation of the ECP?

48. Have sensor systems/intrusion detection systems, etc. been incorporated into the design?

49. Has enough electrical power to operate all portions of the ECP without interruption been included in the design? Is emergency power backup available?

ECP CONSTRUCTION SEQUENCE CHECKLIST

This checklist is taken from the tabular form that is available as a MS Word document in the electronic version of the ECP Guide. The purpose of this checklist is to assist the small-base leader in constructing a new ECP that is functional and supports the mission of the small-base. Throughout the construction phase it is important that the ECP continue to maintain the force protection measures of the small-base. There is no standard sequence for constructing a small-base ECP. The method or sequence of steps for constructing an ECP will be site dependent and driven by the many design considerations.

The following generic sequence of steps should be adapted for each site. Many of the steps should be conducted simultaneously in order to maximize protection as soon as possible. As a general rule, ECP construction should begin adjacent the small-base perimeter and continue outward until the ECP is completed.

General Information

- □ Name of small-base, location
- □ Estimate number of vehicles that will enter ECP daily
- □ Estimate number of personnel that will enter ECP daily

Construction Sequence Checklist

1. Have security and hasty fighting positions been prepared to protect the construction site and continue small-base protection measures?

2. Have crew-served weapons systems been positioned as overwatch for the ECP? Have overwatch/guard towers been constructed? Do overwatch positions have interlocking fields of fire and can they provide cover and observation of the entire ECP?

3. Have fields of fire/clear zones been cleared around the ECP?

4. Have initial entry/access control measures been established for use while the ECP is being constructed?

5. Has signage been installed that provides simple and clear instructions for access through the ECP during construction?

6. Are vehicle barriers or other field-expedient methods used to block high-speed avenues of approach into the ECP and eliminate or reduce straight-line access from local entry/access roads?

7. Are vehicle barriers used to form the nonlinear serpentine lanes through the ECP and to create the perimeter walls of the ECP to contain, segregate and channelize vehicle and pedestrian traffic?

    - Ensure lanes are wide enough to accommodate oversize vehicles.
    - Ensure vehicle turn-around and rejection areas are constructed in the layout.
    - Ensure exit lanes, if needed, maintain same level of security and required access control measures.
    - Seamlessly connect ECP barrier walls into the perimeter security/ wall system.
    - Construct a parking/transfer yard for authorized vehicles. Ensure space is large enough to conduct vehicle searches, if needed.
    - If needed, construct a vehicle search area. Ensure a separate area is constructed to segregate the drive/passengers so they cannot observe search procedures.
    - If needed, construct a pedestrian search area. Ensure a separate

area is constructed to segregate pedestrians from those being searched so they cannot observe search procedures.

- Install personnel barriers around/on vehicle barriers to prevent unauthorized personnel from attempting to climb or gain access over the walls of the ECP.

- Ensure the layout eliminates potential enemy hiding places/cover positions.

8. Are movable vehicle barriers installed at the entrance to the ECP?

9. Are ECP personnel protected to the maximum extent possible by constructing hardened fighting positions? Have both primary and alternate positions been constructed? Has overhead protection been included to protect against artillery or mortar fire?

10. Has a final denial barrier/hardened perimeter gate been constructed at the entrance to the small-base?

11. After establishing the nonlinear, serpentine lanes and walls of the ECP, have vehicle barriers been installed through the lanes as vehicle speed management techniques?

12. Has screening/obscuration material to block surveillance/observation of ECP operations been installed? Have natural or man-made enemy vantage points been eliminated or reduced?

13. Have electric power requirements been installed?

14. Has security lighting been installed?

15. Have applicable technology solutions been installed, if available (i.e., vehicle and personnel screening equipment)?

16. Has an external parking lot for unauthorized vehicles been constructed? Has the lot been constructed at a distance that maximizes standoff protection for critical assets?

17. Has any additional needed signage been installed?

18. Has a plan been developed to continue to improve and structurally harden the ECP?

ECP RISK WORKSHEETS

This process for estimating ECP risk level is based on the process and worksheet forms that are available as a MS Word document in the electronic version of the ECP Guide. The purpose of the process and worksheets is to determine the ECP risk level in relation to identified enemy threats and develop actions that will reduce risk. The process and worksheets are based on Army FM 5-19, Composite Risk Management.

Risk has two elements: the likelihood of a specific type of enemy attack being successfully executed against the small-base and the consequences of that attack on ECP personnel and operations. Identifying the level of risk will focus and develop courses of action to reduce the risk.

Risk can be reduced in three ways: reducing the likelihood of an attack being initiated, reducing the vulnerabilities to reduce the likelihood an attack being successfully executed and reducing the consequences of an attack.

Examples:

1. (**Reduce attack likelihood**) Improving engagement with the community will often lead to information about enemy locations and plans that can lead to killing or capturing the enemy and disrupting their operations before an attack can occur.

2. (**Reduce vulnerability**) Installing vehicle barriers and overwatch positions and practicing and following escalation of force (EOF) procedures can prevent a VBIED from executing a high speed attack and running the ECP.

3. (**Reduce consequences**) Providing blast and fragment resistant earth-filled barriers and fighting positions/bunkers/barriers for ECP personnel can reduce or prevent injuries and fatalities from VBIEDs.

Use of Risk Worksheets

1. Enter the threats to the ECP into the Attack Likelihood Worksheet. If a recent threat assessment has been conducted you should have a list of potential enemy tactics including the worst case scenario that might be used against your small base.

2. Enter the vulnerabilities of the ECP to each threat tactic into the Attack Likelihood Worksheet. If you have conducted a vulnerability assessment you should have a good idea of what measures are or are not in place to reduce the likelihood of a specific type of attack being successfully executed.

3. Estimate the overall likelihood of a successful attack and enter in Attack Likelihood Worksheet. Given the threat and vulnerabilities to the threat, rate the likelihood as:

    a. **Frequent**: This type of attack occurs very often. Examples may include harassing small arms fire against the ECP or a weekly mortar attack against the base.

    b. **Likely**: Occurs several times, will likely happen at least once during your deployment. An example may be an RPG attack against the ECP.

    c. **Occasional**: Occurs sporadically but is not uncommon. You may or may not experience this attack during your deployment. An example may be a PBIED attack where the suicide bomber detonates in a group of LNs waiting for entry.

    d. **Seldom**: Remotely possible. It is unlikely you will experience this attack during your deployment unless several things go wrong. An example may be an unauthorized vehicle with a VBIED gaining entry to the base.

e. **Unlikely**: Can assume this type of attack will never occur, but it's not completely impossible. An example might be a tactical vehicle enters with a VBIED that has been hidden on it.

4. Estimate the severity of the attack if it were to occur and enter into Attack Severity Worksheet. Severity is a measure of the consequences and includes potential fatalities and injuries, the effect on the mission and any other consequences you think are important such as property/equipment damage. Based on the weapons and tactics that might be used in an attack, the vulnerabilities of the ECP and the estimated consequences, rate the severity as:

   a. **Catastrophic**: This may include complete failure of the mission of the ECP to control access to the base, fatalities and serious injuries, loss of mission-critical equipment, major property damage, etc.

   b. **Critical**: Severely degraded capability to control access, moderate to serious injuries (medevac) but no fatalities, extensive damage to critical equipment, significant property damage (would need replacement, not repairable), etc.

   c. **Marginal**: This may include a degraded ECP mission but access still controlled, minor to moderate injuries (treatable on base), minor (repairable) equipment and property damage, etc.

   d. **Negligible**: No impact on ECP mission, negligible injuries, slight equipment or property damage but still functional, etc.

5. Use the Risk Level Matrix. For each threat, using the Attack Likelihood and Attack Severity, find the risk level and enter it into the Risk Management Worksheet.

6. Review the threat scenario and vulnerabilities for each threat. Indentify actions that will reduce risk. Enter these in the Risk Management Worksheet.

7. For each threat, estimate how the Attack Likelihood and Attack Severity will be reduced by implementing the identified actions and using the Risk Level Matrix determine the residual risk level. Enter it into the Risk Management Worksheet.

Attack Likelihood Worksheet			
Threat ID	**Describe Threat Scenario**	**Describe Vulnerability to Threat Scenario**	**Rate Attck Likelihood (Frequent, Likely, Occasional, Seldom, Unlikely)**
Example 1. Sniper	*Sniper Fires at ECP personnel and LN pedestrians entering EFCP*	*No surveillance of enemy vantage points, no screening of ECP personnel or pedestrians*	*Likely*
2.			
3.			
4.			
5.			
6.			
7.			

Attack Severity Worksheet		
Threat ID	**Describe the expected consequences of the attack (Effect on ECP mission, potential fatalities and injuries, expected property damage, etc.)**	**Rate Attack Severity (Catastrophic, Critical, Marginal, Negligible)**
Example 1. Sniper	*Severely degraded mission, potential for LN fatalities and serious injury to ECP personnel. Negligible property damage*	*Catastrophic*
2.		
3.		
4.		
5.		
6.		
7.		

Risk Level Matrix					
Attack Severity	**Attack Likelihood**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L
RISK LEVEL:	**E-Extremely High**		**H-High**	**M-Moderate**	**L-Low**

Risk Management Worksheet			
Threat ID	**Risk Level**	**Recommended design and operational modifications that will reduce attack likelihood and/ or severity**	**Anticipated Residual Risk Level after modifications are implemented**
Example 1. Sniper	*E*	*Identify and survey potential enemy sniper locations, construct screens to obscure/ protect ECP personnel and LN pedestrians.*	*M*
2.			
3.			
4.			
5.			
6.			

ADDITIONAL ECP TOOLS

The electronic version of the Small-Base ECP Guide includes the following tools that can be viewed and printed for use:

- □ Template for ECP SOP (reprinted from JEEP Handbook - Appendix E)
- □ Guidelines for Development of an ECP Operations SOP (reprinted from 3 ID Warfighting Handbook)
- □ Escalation of Force (EOF) - Day-Night Measures (reprinted from 3 ID Warfighting Handbook)
- □ EOF Measures – Example (reprinted from the 3 ID Warfighting Handbook)
- □ GTA 90-01-003. Vehicle Search Techniques
- □ Vehicle Registration Plates of Afghanistan, Tactical Pocket Reference, Pocket Reference Asymmetric Warfare Group
- □ GTA 21-08-002. Basic Combat Training Smart Card
- □ Counter IED Smart Cards (reprinted from Multi-national Corps - Iraq)
- □ Sniper Awareness and Counter-Sniper Tips, Asymmetric Warfare Group
- □ Tactical Questioning Pocket Reference, Asymmetric Warfare Group

Calculations of structure damage and resulting human injury can be performed with blast effect software. However, a structural engineer familiar with blast effects should be involved to ensure that building structural characteristics are correctly modeled in the software.

Antiterrorism (AT) Planner. AT Planner is a digital analysis tool to evaluate building damage and injury to occupants resulting from explosive threat scenarios. AT Planner emphasizes the evaluation of structural components, windows, personnel, and other assets. Structural components are defined for columns, walls, and roofs, including common construction materials. The software is available from the US Army Engineer Research and Development Center at https://atplanner.erdc.usace.army.mil (Accept the security certificate presented and log in with User Name atpuser and Password 4u2plan. Follow the site instructions to obtain the software and an activation key).

Building Injury Calculator and Databases (BICADS). The BICADS software approximates the number of human injuries from the building debris generated by a blast load on the structure. The user defines the basic building construction, building occupants, and blast source. The software then calculates injury estimates based on data from terrorist bombings, accidental explosions, explosive tests, simple engineering models, and engineering judgment. BICADS is available from the US Army Corps of Engineers Protective Design Center at https://pdc.usace.army.mil/software/bicads/. Follow the instructions on the site to obtain the software.

Vulnerability Assessment Protection Option (VAPO). VAPO is designed to support force protection evaluators and planners with the ability to address modern asymmetric threats such as improvised IEDs and chemical and biological weapons. VAPO uses fast running, physics-based algorithms to predict cratering, fragmentation, blast damage and subsequent collateral effects resulting from chemical or biological agent dispersion. VAPO calculates the blast and fragmentation environment for urban scenes, to include effects of reflection and diffraction of blast pressures off and around structures. VAPO also models progressive collapse of buildings. All VAPO requests must be made on the Defense Threat Reduction Agency, Assessment of Catastrophic Events Center (ACECenter) web site at https://acecenter.cnttr.dtra.mil/acecenter/_login.cfm

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CHAPTER 7
ECP RESOURCES

The following resources are included in the electronic version of the Small-Base ECP Guide. These resources provide detailed guidance on both current doctrine related to ECPs and best practices related to planning, design, construction, and operation of ECPs.

- ☐ GTA 90-01-011. Joint Forward Operations Base (JFOB) Survivability and Protective Construction Handbook
- ☐ GTA 90-01-018. Joint Entry Control Point and Escalation of Force Procedures (JEEP) Handbook
- ☐ UFC 4-022-01 - Security Engineering: Entry Control Facilities/Access Control Points
- ☐ UFC 4-022-02 - Selection and Application of Vehicle Barriers
- ☐ Joint Non-Lethal Weapons Directorate, Non-Lethal Capabilities Exercise Reference Book
- ☐ TC 19-210. Access Control Handbook, HQ DA
- ☐ CALL Handbook #07-19 - Base Defense Tactics, Techniques, and Procedures
- ☐ CALL Handbook #10-11 - Escalation of Force: Afghanistan TTPs
- ☐ CALL Handbook #06-15 - Traffic Control Point Operations, Tactics, Techniques, and Procedures
- ☐ AFH 10-2401 - Air Force Vehicle Bomb Mitigation Guide

- ☐ US Department of State Certified Anti-Ram Vehicle Barriers
- ☐ DoD Certified Anti-Ram Vehicle Barriers
- ☐ USMC Small-Unit Leader's Guide to Urban Operations
- ☐ USMC Center for Lessons Learned: Female Searchers in Al Anbar

Small-Base Entry Control Point Guide:
A Practical Guide for the Small-Base Leader
GTA 90-01-034

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