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Physical Security Criteria Bridging the Gap Between Theory and Practical Application

Welcome to Physical Security Criteria – Bridging the Gap Between Theory and Practical Application

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in Case of an
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Learning Objectives

- Learn and Understand
 - Core principles of physical security design
 - Department of Defense Physical Security Planning and Criteria UFC's 4-020-01 and 04-010-01
 - Approaches to mitigate the hazards associated with Physical Security

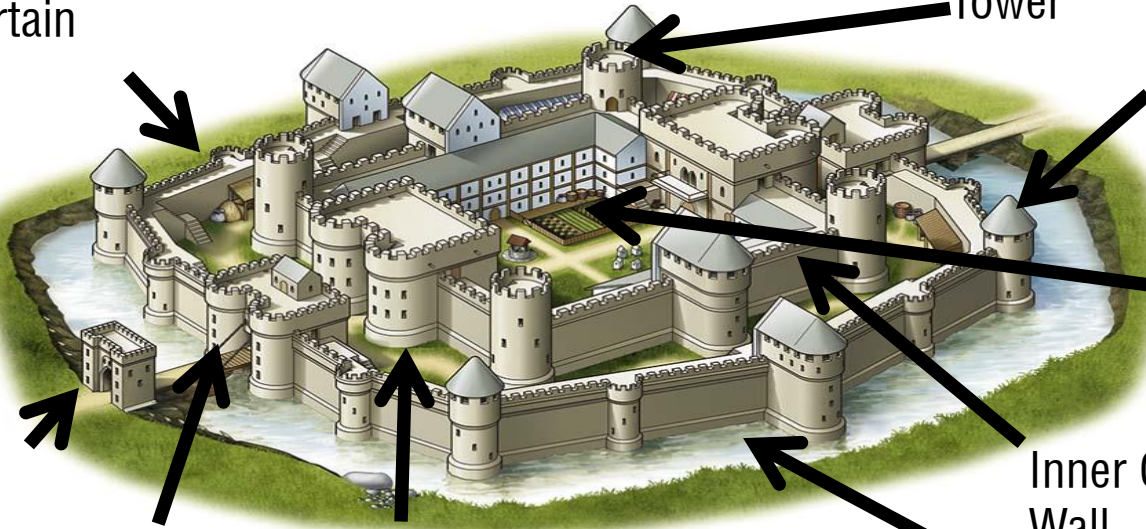


Risk Reduction Basics

Outer Curtain
Wall

Tower

Drum Tower



Inner
Ward

Inner Curtain
Wall

Moat

Outer Ward

Inner Gate

- **Concentric Levels of Protection**
 - Progressively Reduces Threat



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Protective System

Protective System Functions

Detect

- Electronic Security System
 - Intrusion detection
 - Alarm communication
 - Alarm assessment
 - Access control
- Security Forces
- Security Lighting
- DoD Personnel
- Responsible Citizens

Delay or Defeat

- Barriers
 - Fences
 - Facility roof, walls, and floors
 - Doors
 - Windows
 - Locks
- Distance
- Vegetation
- Procedures

Respond

- Interruption
 - Communication to response force
 - Deployment of response force
 - Neutralization



DoD Criteria Evolution

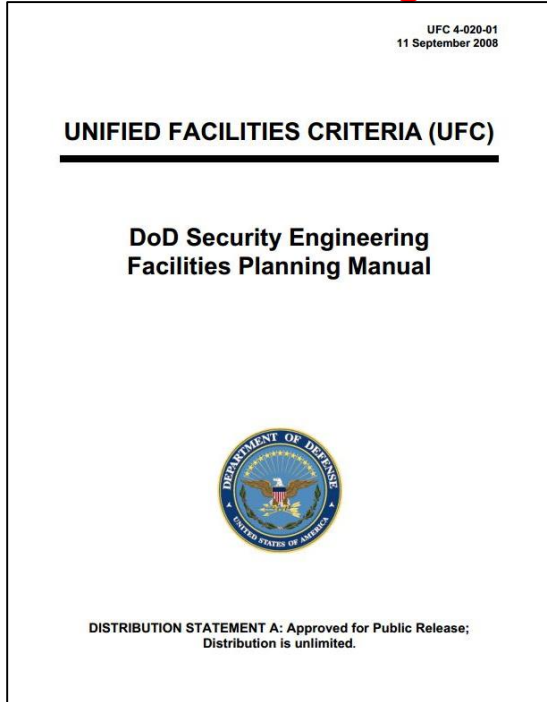
Prescriptive Criteria



Performance Criteria



DoD Criteria Starting Point



- 18 Asset Categories
- 10 Aggressor Types
- 13 Tactics
- 5 Levels of Protection



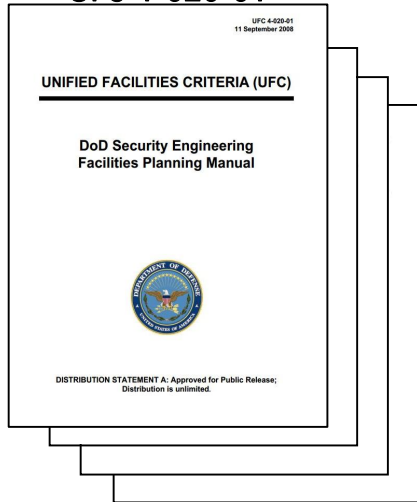
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Design Criteria Development

UFC 4-020-01



Asset Value $A_v \leq 0.5$

YES

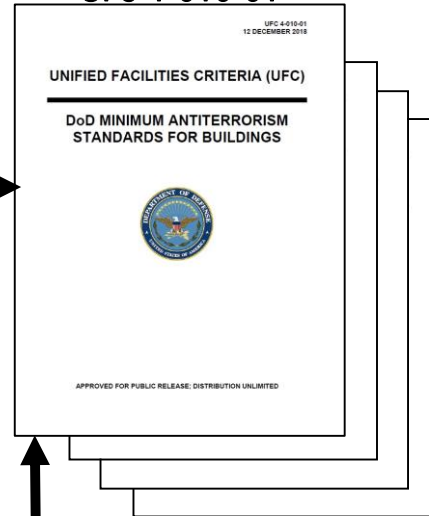
NO

All aggressor likely
rating $T_L \leq 0.5$

YES

NO

UFC 4-010-01



Design Criteria

Risk Assessment
Process

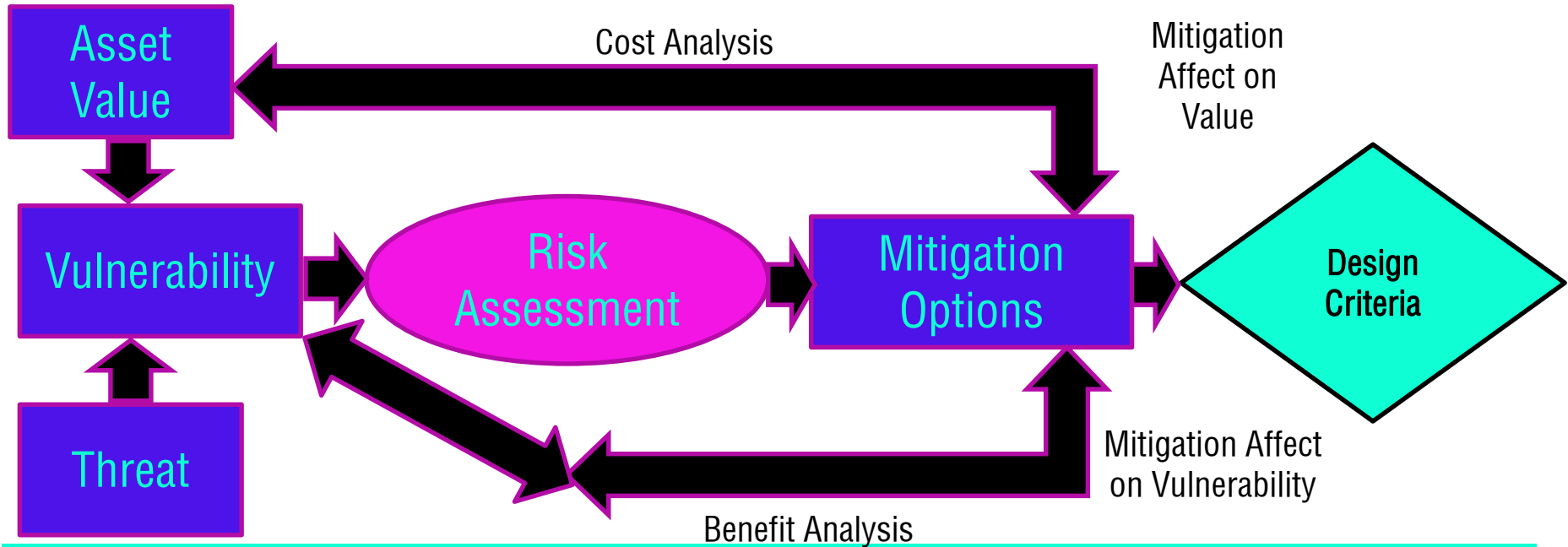


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Risk Assessment Process



$$\text{Risk} = \text{Asset Value} \times \text{Threat Rating} \times \text{Vulnerability Rating}$$

Source: FEMA 426



Risk Assessment Standard



UFC 4-020-01
11 September 2008

UNIFIED FACILITIES CRITERIA (UFC)

DoD Security Engineering Facilities Planning Manual



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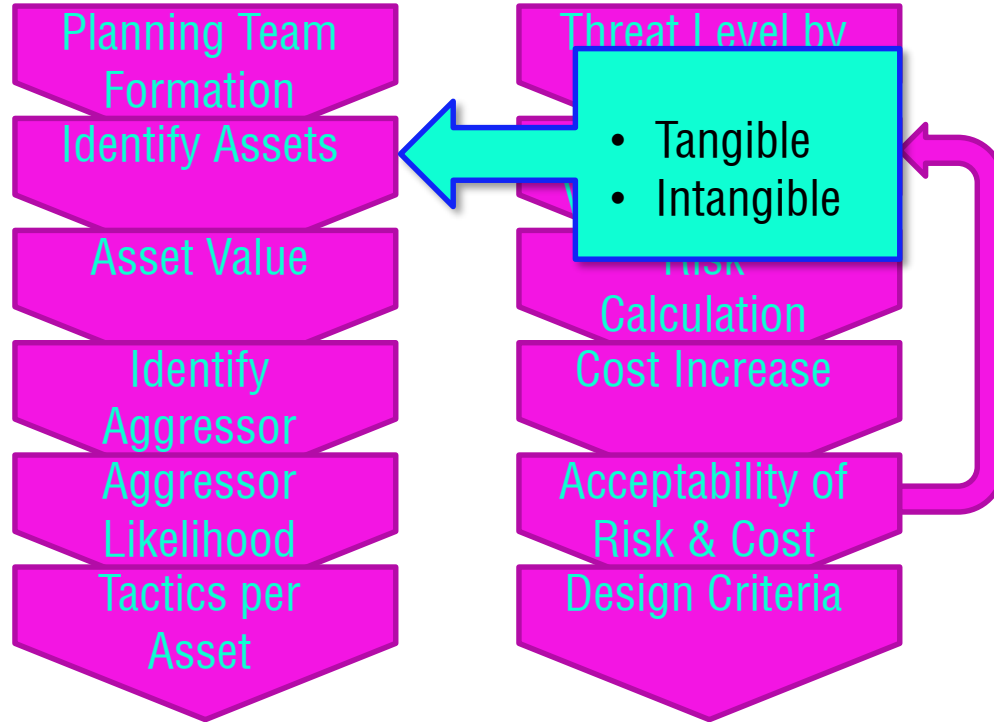


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Risk Assessment Standard



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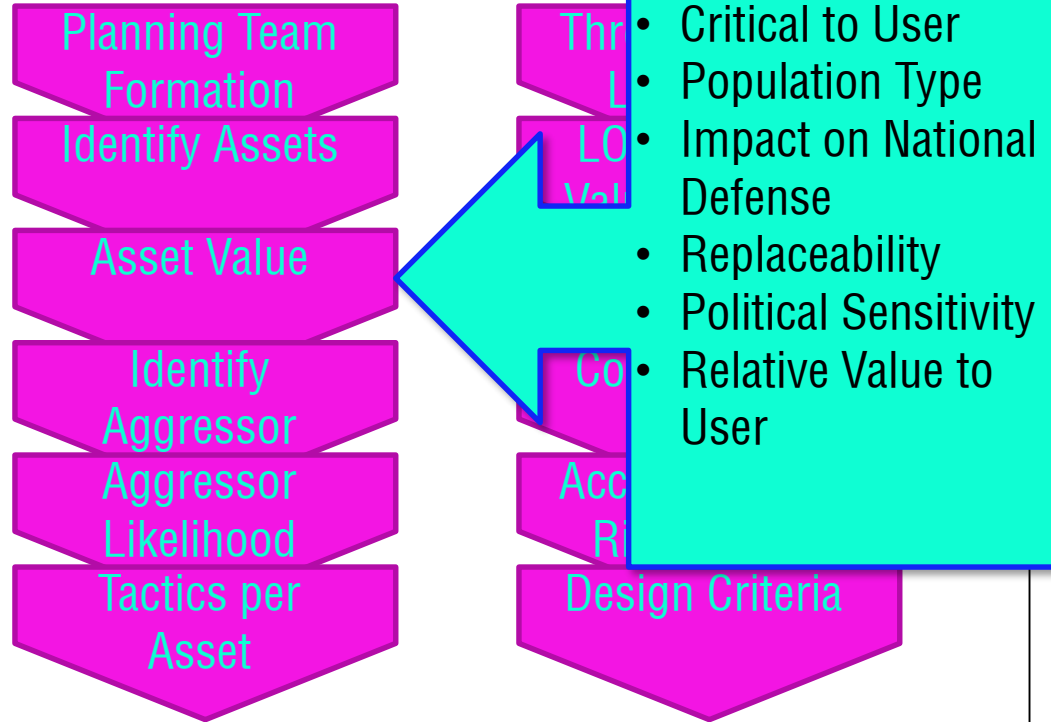


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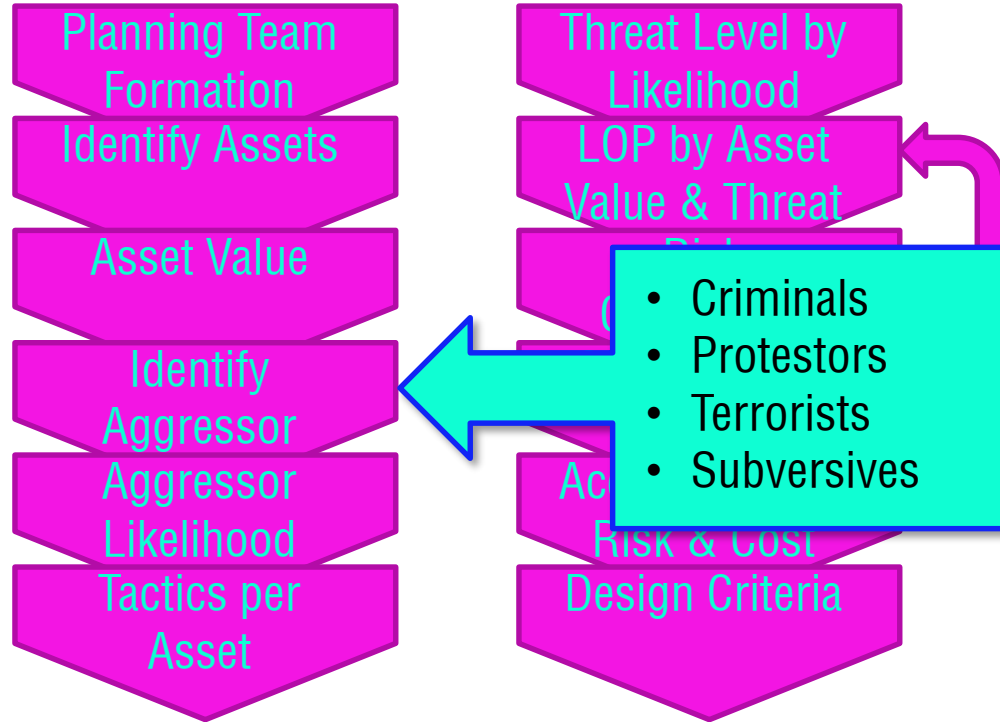


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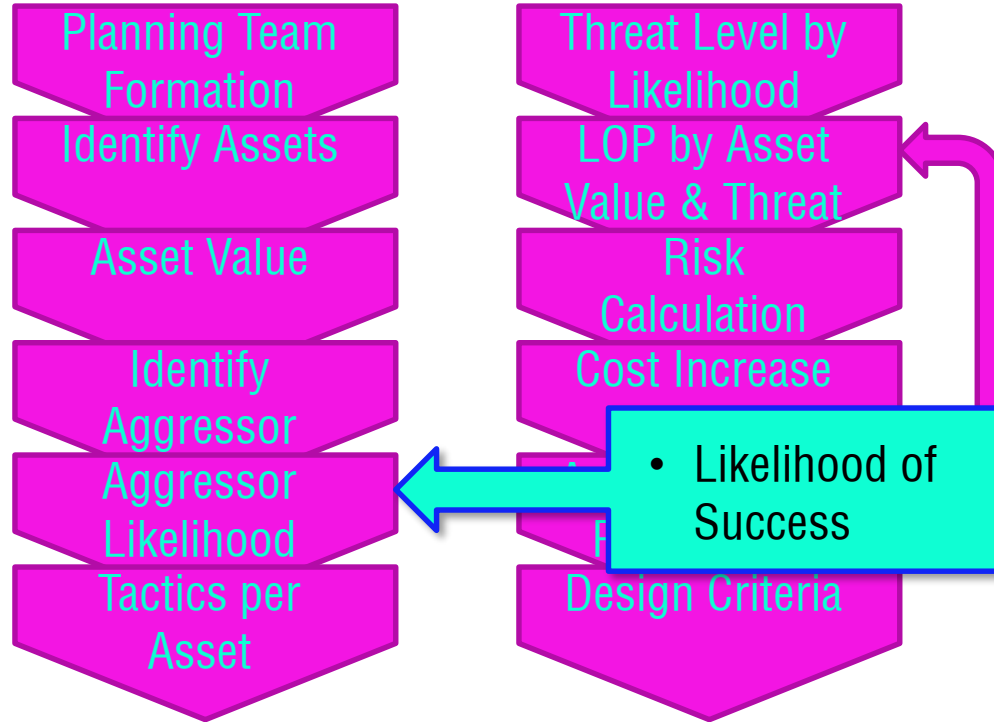


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Risk Assessment Standard



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Risk Assessment Standard



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- Explosives & Incendiary Devices
- Standoff Weapons
- Entry
- Surveillance & Eavesdropping
- Contamination
- Waterfront attack

Public Release;

Risk Assessment Standard



- Severity of Attacks
- Low
- Moderate
- Significant
- High

Facilities Planning Manual



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Risk Assessment Standard



- Low
- Medium
- High
- Very High

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Engineering
Planning Manual



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Risk Assessment Standard



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$$\bullet R = A_V \times T_{LH} \times (1 - P_E)$$



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Risk Assessment Standard



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**DoD Security Engineering
Facilities Planning Manual**

If not acceptable adjust:

- LOP
- Threat

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Risk Assessment

- Asset Value
 - Tangible and Intangible
 - Supports building function
 - Degree of debilitating impact if damaged or destroyed.
- Threat Rating
 - Aggressor
 - Existence
 - Capability
 - History
 - Intentions
 - Targeting
 - Weapons, tools and tactics
- Vulnerable Rating
 - Weaknesses that can be exploited

Asset
Value

Threat

Vulnerabil
ity



18 Asset Categories

Assets	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
People (Mission Critical and General Population)	✓	✓
Aircraft and components at aviation facilities	✓	
Ships, boats and other watercraft	✓	
Vehicles and carriage mounted or towed weapons systems and components	✓	
Petroleum, oils and lubricants (POL)	✓	
Arms, ammunition and explosives (AA&E)	✓	
Controlled medical substances	✓	
Comm./elect. test, meas. and diag. equip. and tool kits and night vision devices	✓	
Organizational clothing and individual equipment	✓	



18 Asset Categories (Continued)

Assets	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
Subsistence items at commissaries, warehouses and troop issue facilities	✓	
Repair parts at installation supply and direct support units	✓	
Facilities engineering supplies and construction material	✓	
Audiovisual equipment, training devices and sub-caliber devices	✓	
Misc. pilferable assets and currency or negotiable instruments	✓	
Critical infrastructure and industrial equipment	✓	
Controlled cryptographic items	✓	
Sensitive information	✓	
Activities and operations	✓	



10 Default Aggressor Types

Aggressor	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
Unsophisticated Criminals	✓	
Sophisticated Criminals	✓	
Organized Criminal Groups	✓	
Vandals	✓	
Extremist Protest Groups	✓	
Domestic Terrorists	✓	✓
International Terrorists	✓	✓
State Sponsored Terrorists	✓	
Saboteurs	✓	
Foreign Intelligence Services	✓	



13 Default Tactics

Tactic	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
Moving Vehicle Bomb	✓	
Stationary Bomb	✓	
Hand Delivered Bomb	✓	
Indirect Fire Weapon	✓	
Direct Fire Weapon	✓	
Forced Entry	✓	
Covert Entry	✓	
Visual Surveillance	✓	
Acoustical Eavesdropping	✓	
Electronic Emanations Eavesdropping	✓	



13 Default Tactics (Continued)

Tactic	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
Airborne Contamination	✓	Limited
Waterborne Contamination	✓	
Waterfront Attack	✓	



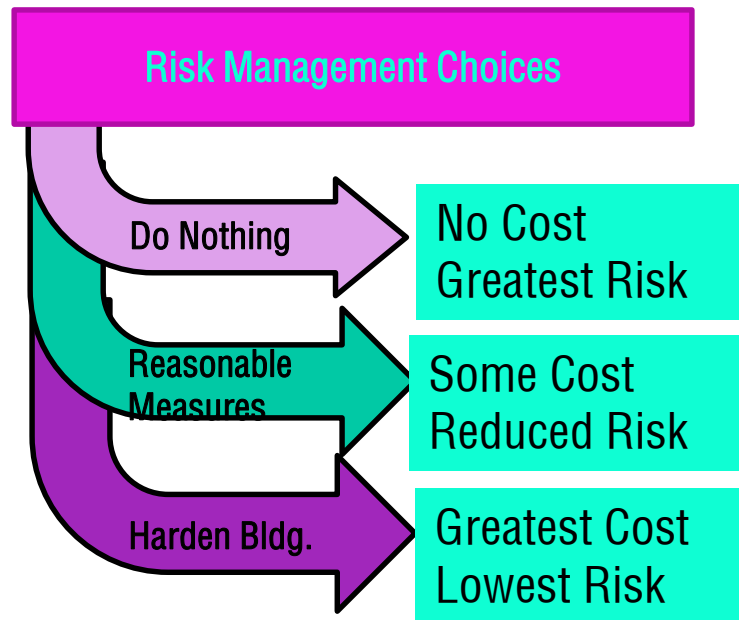
Level of Protection

Aggressor	Facility Planning Manual (UFC 4-020-01)	Minimum Antiterrorism Standards for Buildings (UFC 4-010-01)
Very High	✓	
High	✓	
Medium	✓	
Low	✓	
Very Low	✓	



Risk Assessment

- Prioritize Risk = Asset Value x Threat x Vulnerability
- Identify Mitigation Options
 - Reduce value, threat, vulnerability
- Estimate Cost
- Cost-Benefit Analysis
 - By committee
 - Protective Design Consultant
 - Building Owner
 - Tenant
 - Security
 - Site management
 - Key Function Representatives
 - Others
- Codify Design Criteria



Source: FEMA 426



Risk Assessment Standard

- DoD Security Engineering Facilities Planning Manual,

UFC 4-020-01

- Require Risk Analysis
- Results in Design Criteria
- May Reference FOUO Support Standards
- Or DoD Minimum Antiterrorism Standards for Buildings,

UFC 4-010-01

UFC 4-020-01
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DoD Security Engineering Facilities Planning Manual



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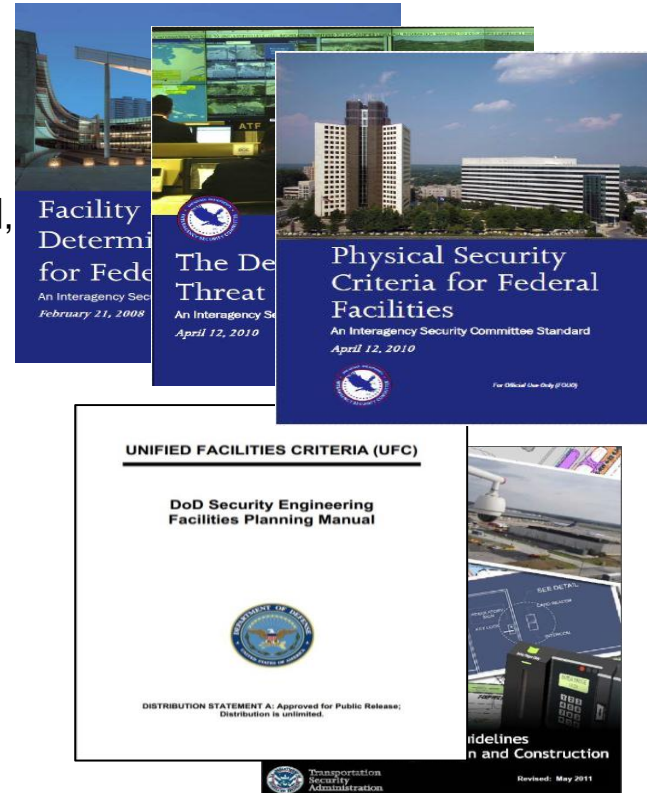
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Risk Assessment Standards

- Prominent Standards
 - ISC, Physical Security Criteria for Federal Facilities (FOUO)
 - DoD Security Engineering Facilities Planning Manual, UFC-4-020-01
- Other Standards
 - TSA, Recommended Security Guidelines for Airport Planning, Design and Construction
- Require Risk Analysis
- Results in Design Criteria



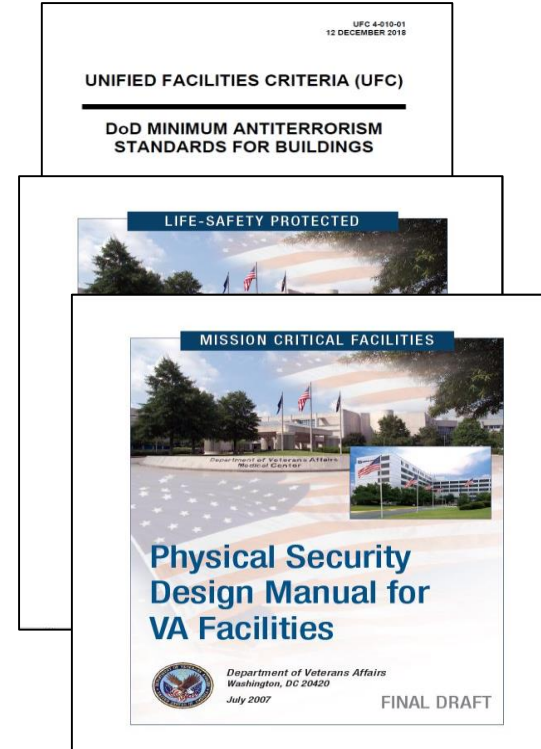
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Risk Reduction Criteria

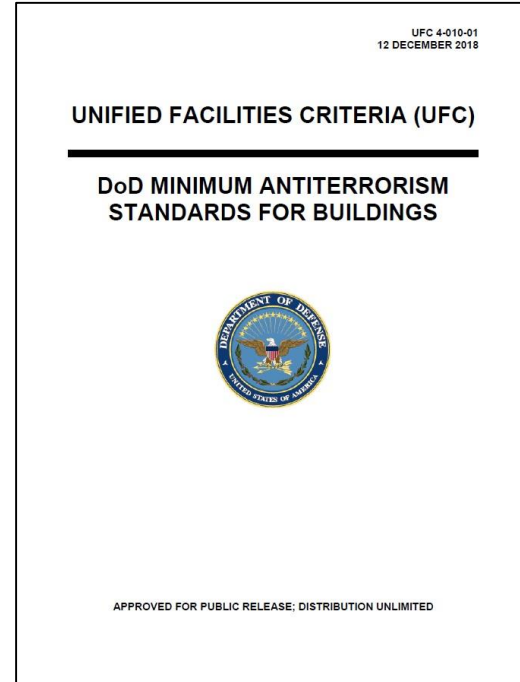
- Prominent Design Criteria
 - GSA Facility Security Requirements for Explosive Devices Applicable to Facility Security Levels III and IV, GSA's Interpretation of the Interagency Security Committee (ISC) Physical Security Criteria. (FOUO)
 - DoD Minimum Antiterrorism Standards for Buildings, UFC 4-010-01
 - VA Physical Security Design Manuals (PSDM) for Life Safety & Mission Critical Facilities
- Minimum Standards
- Need to be adapted to private facilities



Risk Reduction Design Criteria

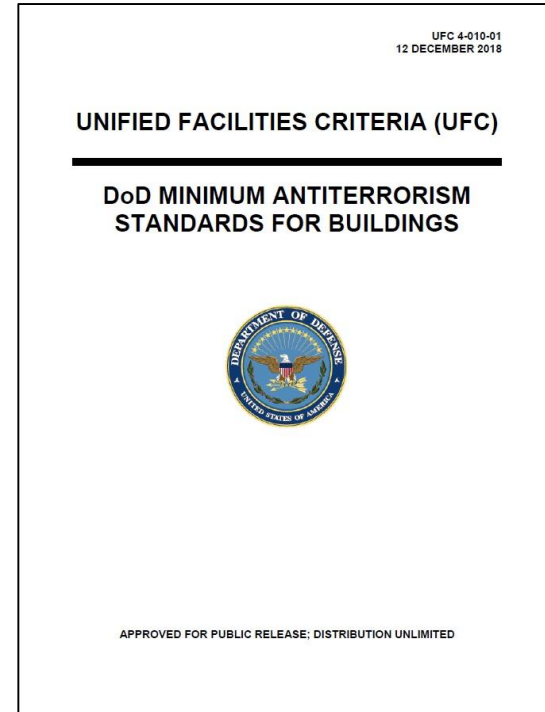
– DoD Minimum Antiterrorism Standards for Buildings, UFC 4-010-01

- Minimum Standards
- Consider Installation Specific Threats



DoD Minimum ATFP Criteria

- DoD Design Criteria
- Combination of performance and prescriptive requirements.



Questions?

Next: DoD Minimum Antiterrorism Standards for Buildings

Stephen L Morgan



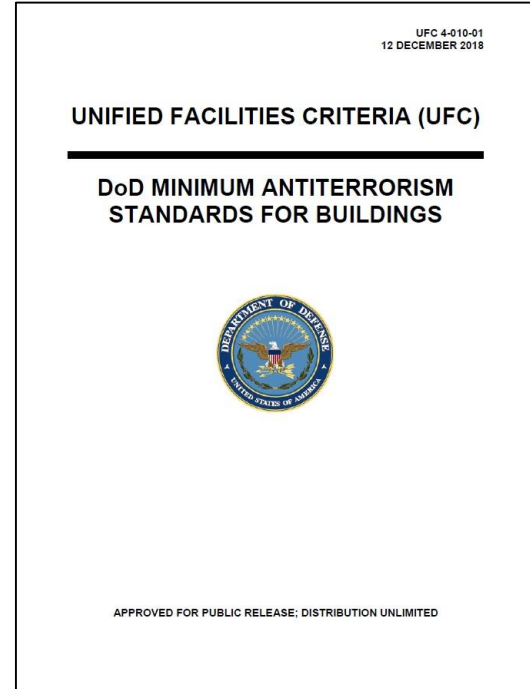
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UFC 4-010-01 Content Overview

- Intent of UFC 4-010-01
- Recent Changes
- Applicability
- Standoff Distance
- Standards within the UFC
- Recommendations
- Expeditionary Structures



Intent of UFC 4-010-01

- **Reduces Collateral Damages and the Scope and Severity of Mass Casualties** in buildings in the event of a terrorist attack
- **Cost effective, implementable and enforceable means** of protecting DoD personnel against a terrorist attack



Recent Changes to UFC 04-010-01

- Standoff Distance now are only measured to the installation perimeter.
- Blast design requirements have been eliminated
- Installation perimeter clear zone has been added
- Standards 3 and 4 have been removed



Applicability of UFC 04-010-01

- All new non-exempt buildings shall comply with the UFC including
 - DoD Occupied Buildings
 - Non DoD Tenant Buildings on DoD property
 - National Guard Buildings
 - Visitor Centers and Museums
 - Visitor Control Centers at entry control Facilities/Access control points
 - Expeditionary



Applicability of UFC 04-010-01

- Existing Buildings shall comply with the UFC when Triggered by the following
 - **Major Investment** – When renovation exceeds 50% of the total plant replacement value ,excluding costs to meet this standard.
 - **Change of Occupancy** – Low occupancy to inhabited
 - **Window, Skylight and Glazed Door Replacement and Installation**
 - **HVAC Improvements**



Applicability of UFC 04-010-01

- **Building Additions**
 - If addition area is greater than 50% of the existing building
- **Leased Buildings**
 - Shall conform with Interagency Security Committee standards
- **DoD Purchase of Existing Buildings**
- **Privatized Buildings**



Exemptions of UFC 04-010-01

- Buildings exempted from all provisions in the UFC
 - Low occupancy family housing
 - Low occupancy buildings
 - Fisher houses with 24 units or less
 - Town Centers
 - Enhanced Use leases
 - Transitional Structures and spaces
 - Temporary relocatable buildings
 - Parking structures



Building Categories

- **Inhabited** – Buildings sheltering DoD personnel routinely occupied by 11 or more and a populations density of more than 1 person/430 SF
- **Low Occupancy** – Buildings sheltering DoD personnel routinely occupied by fewer than 11 or population density less than 1 person/430 SF
- **Historic Buildings**
 - Determine adverse affects caused by standard implementation
 - Historic status does not negate the implementation of the standard



Standards Within UFC 4-010-01

- Standard 1 – Standoff Distance
- Standard 2 – Unobstructed Space
- Standard 3 – Removed
- Standard 4 – Removed
- Standard 5 – Parking Beneath Building or on Roof Tops
- Standard 6 – Progressive Collapse
- Standard 7 – Structural Isolation
- Standard 8 – Building Overhangs and Breezeways
- Standard 9 – Exterior Masonry Walls
- Standard 10 – Windows and Skylights
- Standard 11 – Building Entrance Layout
- Standard 12 – Exterior Doors
- Standard 13 – Mail Rooms and Loading Docks
- Standard 14 – Roof Access
- Standard 15 – Overhead Mounted Architectural Features
- Standard 16 – Air Intakes
- Standard 17 – Mail Room and Loading Dock Ventilation
- Standard 18 Emergency Air Distribution
- Standard 19 – Equipment Bracing
- Standard 20 – Under Building Access
- Standard 21 – Mass Notification



Standoff Distance – Standard 1

- What is Standoff Distance?
 - Previously this was measured to parking, roadways and controlled perimeters. All this information still resides in Appendix B of the document .
 - Now standoff distance is only measured to the installation perimeter
 - If building is off an installation development of the Design Basis Threat and Associated Standoff distances in accordance with UFC 4-020-01 is required



Standoff Distance – Standard 1

- **Important Site Features**

- **Installation perimeter** – a physical boundary around an installation.
- **Clear Zone** – Areas established around perimeters to provide unobstructed views to enhance detection and assessment.
- **Unobstructed Space**
 - Space that extends from the building that precludes the concealment of explosive devices with dimensions of 6 in or larger from observation.



Standoff Distance – Standard 1

– Trash Containers

- Not allowed within the unobstructed space unless secured to preclude concealment of explosives or if they are enclosed (Gaps in all sides of enclosure no larger 6 inches with top having a pitch of 1 vert. to 2 horiz.)

– Adjacent Existing Buildings

- Buildings adjacent to new or existing building projects which may or may not have been designed to the current or previous standards



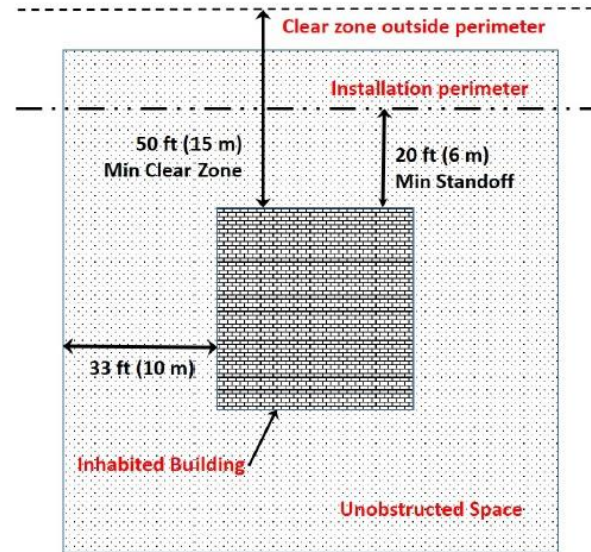
Standoff Distance – Standard 1

- **Installation perimeter** – Standoff distance buildings from the installation perimeter shall be 20 feet if a 30 foot clear zone outside the installation perimeter is provided. If no clear zone is provided then a 50 foot minimum standoff to the installation perimeter is required
- **Unobstructed Space** - 33 feet
- **Adjacent Existing Buildings**
 - Minimum of 33 feet to new buildings.
 - Existing buildings require the 33 foot unobstructed space



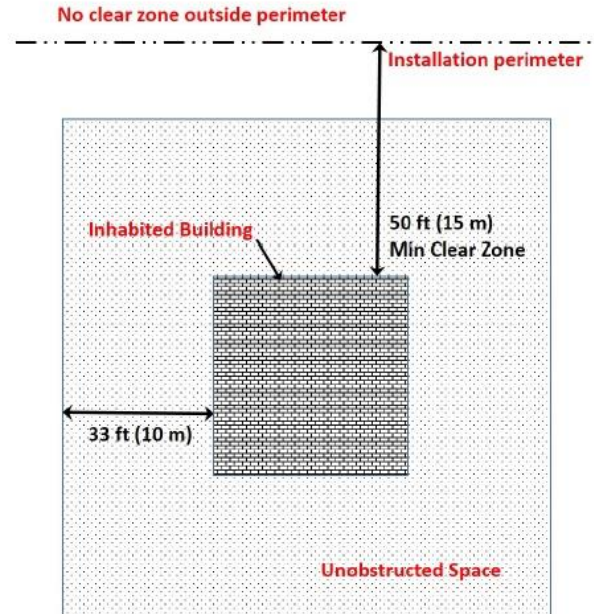
Site Layout Figure 3-1

Figure 3-1 Installation Perimeter with Outer Clear Zone



Site Layout Figure 3-2

Figure 3-2 Installation Perimeter without Outer Clear Zone



Standards Within UFC 04-010-01

- **Standard 1 – Standoff Distances**
 - Identifies standoff distances for new and existing buildings. Discussed in previous slides
- **Standard 2 – Unobstructed Space**
 - Space around inhabited buildings in which there are no opportunities for concealment from observation of explosive devices 6 inches or greater in height or width.
 - The unobstructed space extends from the walls of the building out to the conventional construction standoff distance.
 - **Where controlled parking for existing buildings is utilized, pedestrian access control must also be used to mitigate the threat of a hand delivered device**
 - If more than two sides or within the unobstructed space, container must be 5 sided and prevent concealment of an object 6 inches or greater in height or width
 - Fuel Tanks can be located within the unobstructed space provided they do not provide concealment for 6 inch threat



Standards Within UFC 04-010-01

- **Standard 3 – Drive Up/ Drop-Off Areas**
 - Removed from the UFC
- **Standard 4 – Access Roads**
 - Removed from the UFC.
- **Standard 5 – Parking beneath Buildings or on Roof Tops**
 - Avoid these conditions if at all possible
 - Provided access control incorporate mitigating measures



Standards Within UFC 04-010-01

- **Standard 6 – Progressive Collapse**
 - Applies to all buildings with Risk Category II or Higher.
 - Follow the requirements UFC 4-023-03 Addresses the design procedure for progressive collapse
 - Interior columns and walls must be evaluated at underground parking and uncontrolled public access



Standards Within UFC 04-010-01

- **Standard 7 – Structural Isolation**

- Building additions that are required to comply with these standards are to be structurally independent from existing adjacent building which do not meet these standards unless it is shown through analysis that collapse of the addition or existing adjacent building will not result in collapse of the remainder of the building.
- Low occupancy portions of buildings must be structurally isolated from inhabited portions of the building

Standards Within UFC 04-010-01

- **Standard 8 – Building Overhangs and Breezeways**
 - Avoid building overhangs where inhabited space is located over the overhang
- **Standard 9 – Exterior Masonry Walls**
 - Unreinforced masonry walls are not permitted in new buildings
 - For wood or metal studs refer to Table C-5 for requirements to meet the UFC (Previous UFC Conventional construction design assumptions)



Standards Within UFC 04-010-01

- **Standard 10 – Windows and Skylights**
 - Windows and skylights are not required to be designed or constructed for blast resistance.
 - Minimum glazing requirements are 1/4" nominal laminated glass or polycarbonate.(2) layers of 1/8" glass with inner 0.03" laminating layer materf2248 and polycarbonate glazing framing bite must be 1.5 times the glazing thickness.
 - Translucent panels and glass unit masonry are not required to comply with this standard.



Standards Within UFC 04-010-01

- **Standard 11 –Building Entrance Layout**
 - New building entrances do not face a controlled perimeter
 - Existing buildings which entrance faces a controlled perimeter, use another entrance or screen the entrance
 - Screen sight lines where multiple entrances facing a controlled perimeter occur



Standards Within UFC 04-010-01

- **Standard 12 - Exterior Doors**
 - All exterior doors into inhabited areas must open outward.
 - Glazed doors shall also comply with Standard 10
 - Sliding Glass and Revolving Doors do not have to open outward
 - Overhead doors have no requirements

Standards Within UFC 04-010-01

- **Standard 13 – Mail Rooms and Loading Docks**
 - Located at the perimeter of the building away from heavily populated areas and critical infrastructure
 - These standards do not specifically address blast design of mail rooms and loading docks
- **Standard 14 –Roof Access**
 - Control access to roof on all new and existing buildings



Standards Within UFC 04-010-01

- **Standard 15 – Overhead Mounted Architectural Features**
 - For all new and existing buildings required to meet these standards ensure all overhead mounted architectural features weighing more than 31 pounds is mounted using rigid or flexible systems to minimize the likelihood of falling.
 - Excludes suspended ceilings
 - Must resist $0.5 \times$ Component weight in any horizontal direction and $1.5 \times$ Component weight in vertical direction



Standards Within UFC 04-010-01

- **Standard 16 – Air Intakes**

- All new building intakes must be 10 ft above the ground
- Existing buildings intakes must be 10 ft above ground, means to accomplish this such as chimneys must be provided
- 10 Ft requirement is also required for all HVAC replacement and upgrade projects regardless of cost triggers

- **Standard 17 –Mail Room and Loading Dock Ventilation**

- Provide separate, dedicated air ventilation, exhaust and water systems for mail rooms and loading docks to prevent spread of CBR agents throughout the building
- Mail room and loading dock walls shall extend floor to ceiling and all joints be sealed
- Doors shall be sealed



Standards Within UFC 04-010-01

- **Standard 18 - Emergency Air Distribution**
 - All new and existing buildings required to comply with the standards to have emergency shutoff switch in the HVAC control system
- **Standard 19 – Equipment Bracing**
 - For all new and existing buildings required to meet these standards ensure all overhead mounted utilities and fixtures weighing more than 31 pounds is mounted using rigid or flexible systems to minimize the likelihood of falling.
 - Excludes piping networks
 - Must resist $0.5 \times \text{Component weight}$ in any horizontal direction and $1.5 \times \text{Component weight}$ in vertical direction



Standards Within UFC 04-010-01

- **Standard 20 – Under Building Access**
 - Control access to crawl spaces, utility tunnels and other means of under building access
- **Standard 21 - Mass Notification**
 - System designed in accordance with UFC 4-021-01
 - New buildings to have notification system to provide real time information to building occupants or personnel in the immediate vicinity of the building during emergency stations.
 - For existing buildings these requirements are mandatory for primary gathering, billeting and high occupancy housing and recommended for inhabited buildings.





Q&A AND FEEDBACK

Place slide at the end of
presentation
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