

Commercial Real Estate Women

BRAC 2005 Analysis and Building Security Standards

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Overview

Explosive Blast Threat

BRAC Analysis

Building Security Design Standards

Effects on Communities



Man Made Explosive Blast Threat



• Figure includes the events of September 11, 2001 which are counted as one terrorist incident.

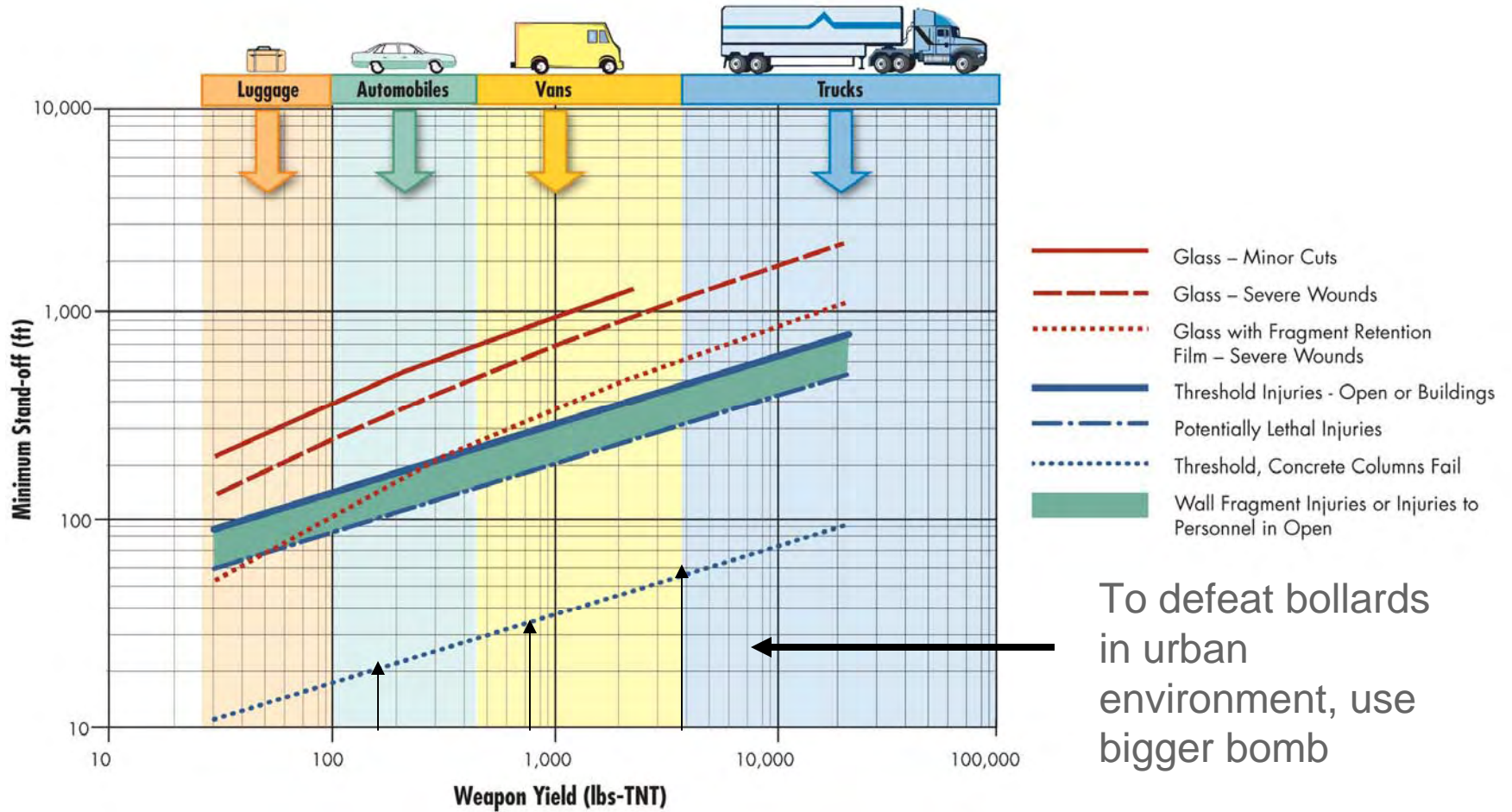


Manchester blast 1996
(approx 3700 lbs TNT equivalent)

Explosive blast is the primary threat of concern



Blast Range to Effects



To defeat bollards in urban environment, use bigger bomb

Defense in depth requires perimeter protection *and* other mitigations



Comparison of Stand-off



Murrah Federal Building

YIELD (≈TNT Equiv.) 4,000 lb.
Reflected PRESSURE 9,600 psi.
Stand-off 15 feet

166 killed – Not Designed
for Progressive
Collapse and Total
Loss



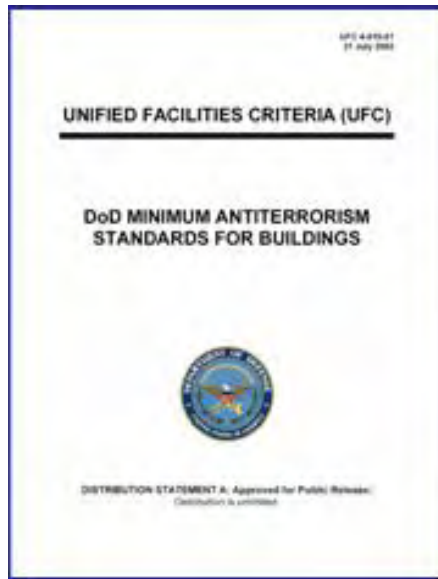
Khobar Towers

YIELD (≈TNT Equiv.) 20,000 lb.
Reflected PRESSURE 800 psi.
Stand-off 80 feet

19 killed – Designed for
Progressive Collapse,
lost façade and
repaired



DOD AT Level Of Protection



Blast Criteria

- 82 feet mitigated
- 148 feet Conventional

Level of Protection	Potential Structural Damage	Potential Door and Glazing Hazards	Potential Injury
Below AT standards	Severely damaged. Frame collapse/massive destruction. Little left standing.	Doors and windows fail and result in lethal hazards	Majority of personnel suffer fatalities.
Very Low	Heavily damaged - onset of structural collapse. Major deformation of primary and secondary structural members, but progressive collapse is unlikely. Collapse of non-structural elements.	Glazing will break and is likely to be propelled into the building, resulting in serious glazing fragment injuries, but fragments will be reduced. Doors may be propelled into rooms, presenting serious hazards.	Majority of personnel suffer serious injuries. There are likely to be a limited number (10 percent to 25 percent) of fatalities.
Low	Damaged – unrepairable. Major deformation of non-structural elements and secondary structural members, and minor deformation of primary structural members, but progressive collapse is unlikely.	Glazing will break, but fall within 1 meter of the wall or otherwise not present a significant fragment hazard. Doors may fail, but they will rebound out of their frames, presenting minimal hazards.	Majority of personnel suffer significant injuries. There may be a few (<10 percent) fatalities.
Medium	Damaged – repairable. Minor deformations of non-structural elements and secondary structural members and no permanent deformation in primary structural members.	Glazing will break, but will remain in the window frame. Doors will stay in frames, but will not be reusable.	Some minor injuries, but fatalities are unlikely.
High	Superficially damaged. No permanent deformation of primary and secondary structural members or non-structural elements.	Glazing will not break. Doors will be reusable.	Only superficial injuries are likely.



UFC 4-010-01 Standards

UFC 4-010-01 APPENDIX B DoD MINIMUM ANTITERRORISM STANDARDS FOR NEW AND EXISTING BUILDINGS	
Standard 1	Minimum Stand-off Distances
Standard 2	Unobstructed Space
Standard 3	Drive-Up/Drop-Off Areas
Standard 4	Access Roads
Standard 5	Parking Beneath Buildings or on Rooftops
Standard 6	Progressive Collapse Avoidance
Standard 7	Structural Isolation
Standard 8	Building Overhangs
Standard 9	Exterior Masonry Walls
Standard 10	Windows, Skylights, and Glazed Doors
Standard 11	Building Entrance Layout
Standard 12	Exterior Doors

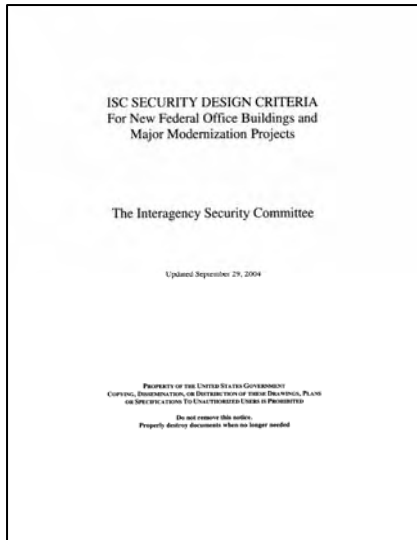


UFC 4-010-01 Standards

UFC 4-010-01 APPENDIX B DoD MINIMUM ANTITERRORISM STANDARDS FOR NEW AND EXISTING BUILDINGS	
Standard 13	Mailrooms
Standard 14	Roof Access
Standard 15	Overhead Mounted Architectural Features
Standard 16	Air Intakes
Standard 17	Mailroom Ventilation
Standard 18	Emergency Air Distribution Shutoff
Standard 19	Utility Distribution and Installation
Standard 20	Equipment Bracing
Standard 21	Under Building Access
Standard 22	Mass Notification



ISC Standards



Blast Criteria

- 20 feet
- 50 feet
- 100 feet (Law, etc)

Level**	Typical Location	Examples of Tenant Agencies***	Security Measures (based on evaluation)
I	10 Employees (Federal) 2,500 Square Feet Low Volume Public Contact Small "Store Front" Type Operation	Local Office District Office Visitor Center USDA Office Ranger Station Commercial Facilities Industrial/Manufacturing Health Care	High Security Locks Intercom Peep Hole (Wide View) Lighting w/Emergency Backup Power Controlled Utility Access Annual Employee Security Training
II	11 - 150 Employees (Federal) 2,500 - 80,000 Square Feet Moderate Volume Public Contact Routine Operations Similar to Private Sector and/or Facility Shared with Private Sector	Public Officials Park Headquarters Regional/State Offices Commercial Facilities Industrial Manufacturing Health Care	Entry Control Package w/Closed Circuit Television (CCTV) Visitor Control/Screening Shipping/Receiving Procedures Guard/Patrol Assessment Intrusion Detection w/Central Monitoring CCTV Surveillance (Pan-Tilt, Zoom System) Duress Alarm w/Central Monitoring
III	151 - 450 Employees (Federal) Multi-Story Facility 80,000 - 150,000 Square Feet Moderate/High Volume Public Contact Agency Mix: Law Enforcement Operations Court Functions Government Records	Inspectors General Criminal Investigations Regional/State Offices GSA Field Office Local Schools Commercial Facilities Industrial Manufacturing Health Care	Guard Patrol on Site Visitor Control/Screening Shipping/Receiving Procedures Intrusion Detection w/Central Monitoring CCTV Surveillance (Pan-Tilt/Zoom System) Duress Alarm w/Central Monitoring
IV	>450 Employees (Federal) Multi-Story Facility >150,000 Square Feet High Volume Public Contact High-Risk Law Enforcement/Intelligence Agencies District Court	Significant Buildings and Some Headquarters Federal Law Enforcement Agencies Local Schools, Universities Commercial Facilities Health Care	Extend Perimeter (Concrete/Steel Barriers) 24-Hour Guard Patrol Adjacent Parking Control Backup Power System Hardened Parking Barriers
V	Level IV Profile and Agency/Mission Critical to National Security	Principal Department Headquarters	Agency-Specific



ISC New Federal Office Standards

ISC Security Design Criteria Sep 2004 For New Federal Office Buildings and Major Modernization Projects	
1.0	Planning and Cost
2.0	Site Planning and Landscape Design
3.0	Architecture and Interior Design
4.0	Structural Engineering
5.0	Mechanical Engineering
6.0	Electrical Engineering
7.0	Fire Protection Engineering
8.0	Electronic Security
9.0	Parking Security



Risk based – flexible LOP and mitigation



ISC Lease Space Standards

ISC Security Design Criteria Sep 2004 Security Standards for Leased Space	
1.0	Perimeter Security
2.0	Entry Security
3.0	Interior Security
4.0	Administrative Procedures
5.0	New Construction – Blast/Setback Standards



ISC Blast Protection Levels

4.1.8 Protection Levels

Your entire building structure or certain portions of the structure will be assigned a protection level according to the facility-specific risk assessment. Protection levels for ballistics and forced entry are described in 4.2. The following are definitions of damage to the structure and exterior wall systems for each protection level:

4.1.8.1 Minimum and Low Protection - Major damage. The facility or protected space will sustain a high level of damage without progressive collapse. Casualties will occur and assets will be damaged. Building components, including structural members, will require replacement, or the building may be completely unrepairable, requiring demolition and replacement.

4.1.8.2 Medium Protection - Moderate damage, repairable. The facility or protected space will sustain a significant degree of damage, but the structure should be reusable. Some casualties may occur and assets may be damaged. Building elements other than major structural members may require replacement.

4.1.8.3 High Protection - Minor damage, repairable. The facility or protected space may globally sustain minor damage with some local significant damage possible. Occupants may incur some injury, and assets may receive minor damage.



ISC CBR Protection Levels

Figure 5-1. Summary of CBR Criteria

Level of Protection	For Biological/Radiological Contaminants	For Chemical/Radiological Contaminants
Minimum, Low, Medium, High	5.1.1 Adopt NIOSH document recommendations	
Low	5.1.2 Use MERV 13 filter or functional equivalent	None
Medium	5.1.3 Use HEPA filter or functional equivalent	5.1.4 Use gas adsorber for outside air
High	5.1.3 Use HEPA filter or functional equivalent	5.1.5 Use gas adsorber for outside air and return air
Medium, High	5.1.6 Design for future detection technology	

BRAC Analysis

Working with VCOMB, NVRC and Arlington, identified approx 130 commercial properties and 300+ leases

Conducted a site analysis of properties using:

- **DoD UFC 4-010-01**
- **GSA ISC Security Design Criteria**

Note: GSA leases the vast majority of space for DoD



BRAC Analysis

The following data was captured for each surveyed structure:

- Number of Stories
- Primary Structure/Facade Type
- Glazing Type
- Parking Situation
- Security Perimeter
- Effective Standoff Distance
- Photo number



Number of Stories

The number of stories for structures captured in this study varied between 1-21. The general trend is that the tallest buildings are located in the eastern regions.

- Rosslyn 12.9
- Crystal City 8.9
- Fairfax 8
- Arlington 7.9
- Bailey's 7.8
- Alexandria 6.5
- Merrifield 6
- Annandale 3
- Springfield 2.7
- Newington 1.4



Primary Structure/Façade Type

Structure/facade types were categorized by:

- **Steel Frame**
- **Concrete**
- **Masonry/Stone**



Concrete



Steel Frame



Masonry/Stone Structure

Glazing Type

Glazing types were categorized by:

- **Curtain walls**
- **Individual Windows**



Structure with curtain wall



Structure with individual Window

Parking

Parking types were categorized by:

- **Underground**
- **Outside**
- **Curbside**



Outside Parking



Underground Parking



Curbside Parking

Perimeter Security

Perimeter security types were categorized by:

- Guard shacks
- Fencing
- Gated Parking
- Barriers

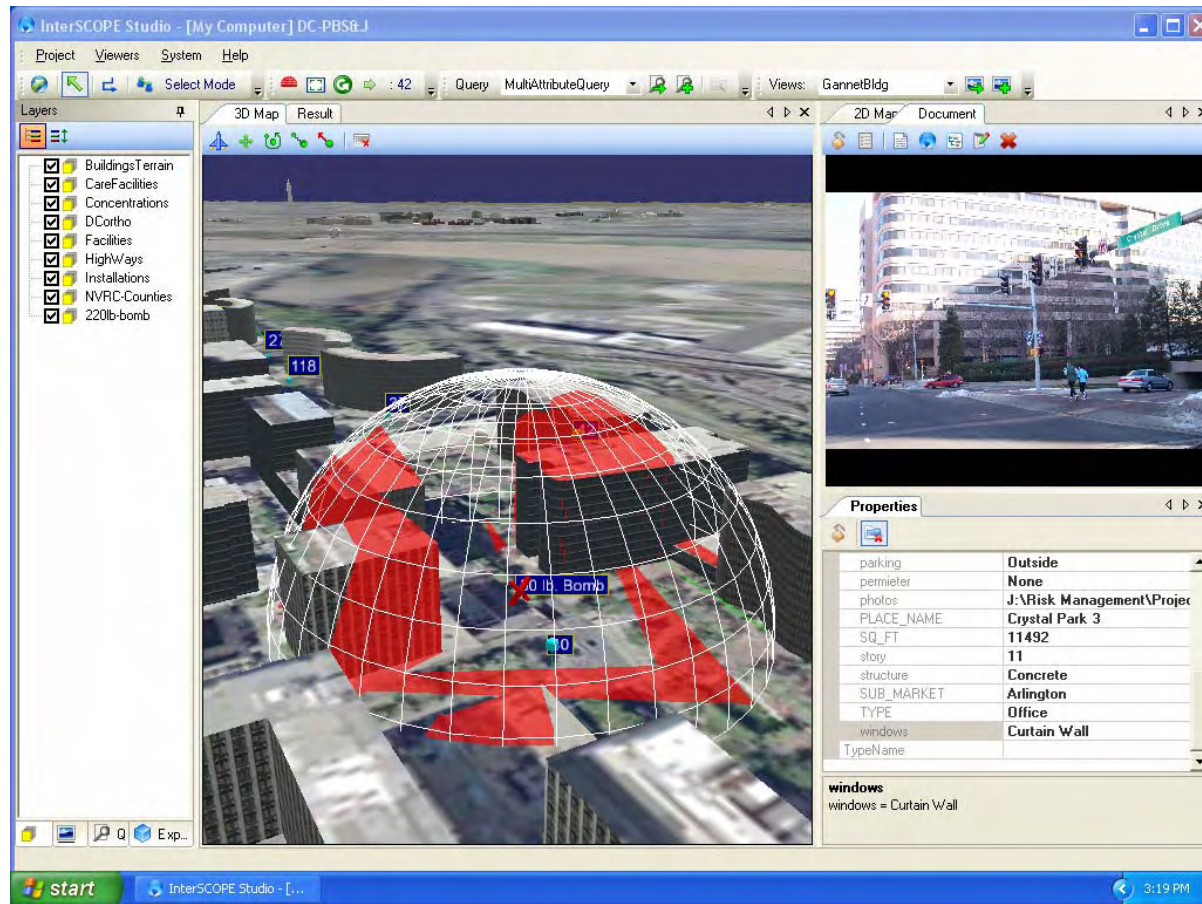


Guard shack



Fencing

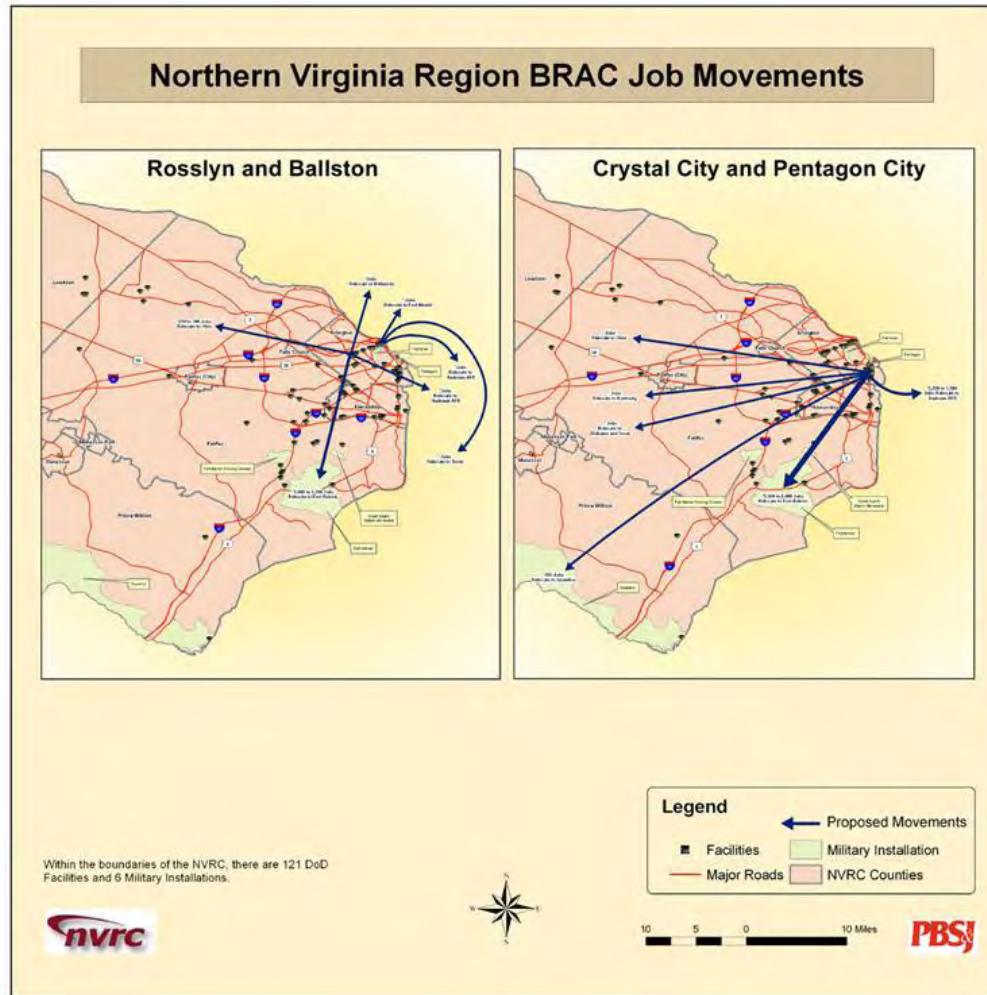
BRAC Building Analysis



NV Facilities and Installations

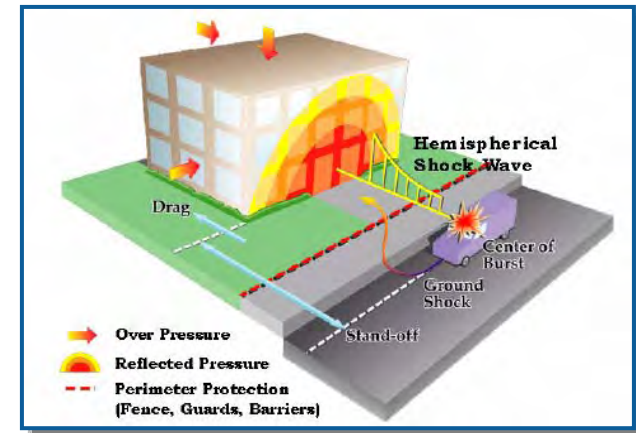


BRAC Movements



Design and Security Challenges

- Initial reaction to man made threats was at building scale (perimeter bollards, barriers, guard patrol)
- No consensus yet on how best to approach community protection (building, block, regional, city)
- Codes are being changed to reflect/incorporate man made threat protection (APA policy, ASCE-7, NFPA 730, etc.)
- Risk based approach is the objective, education is imperative (FEMA 386/426/433)



Initial Reaction



Pedestrian massing



Barrier creates choke point



PBS& Landscape planters



Bollard spacing



Effects on Communities

Government facilities (Owned and Leased)

- Application of the GSA ISC Standards and DoD Unified Facility Criteria – Minimum Antiterrorism Standards in urban environments

Public Space/Services

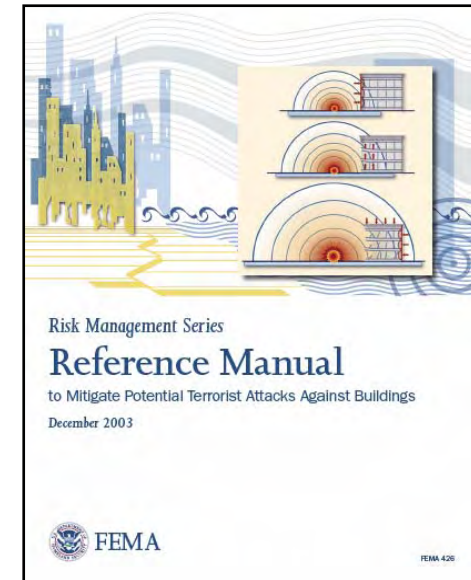
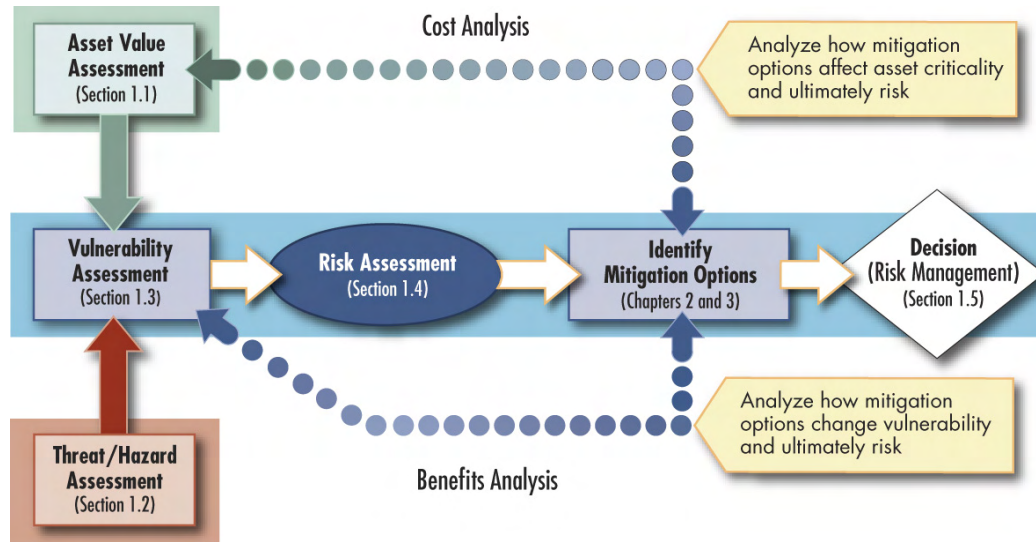
- Sidewalks
- Mass transportation

Tax Revenues

- Retail Space
- Parking



FEMA 426 Reference Manual



426 has both the DoD and ISC criteria included



Integrated perimeter protection



**Objective: Seamless and invisible
Integrated landscape features and
perimeter protection, multiple
layers of defense**



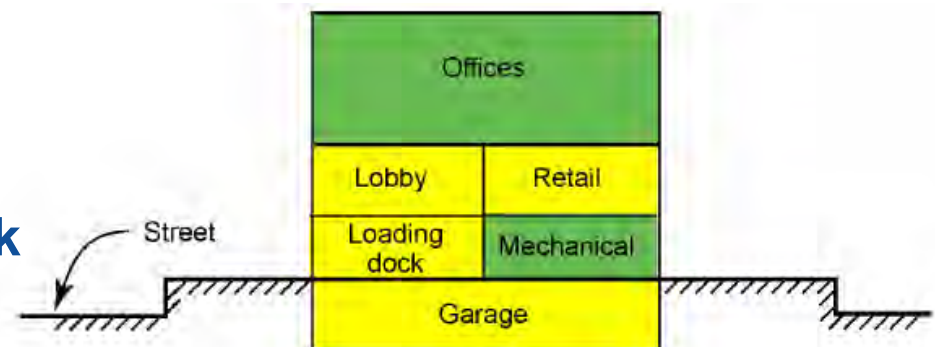
Architectural – Space Design

Place unsecured or high risk areas outside building footprint

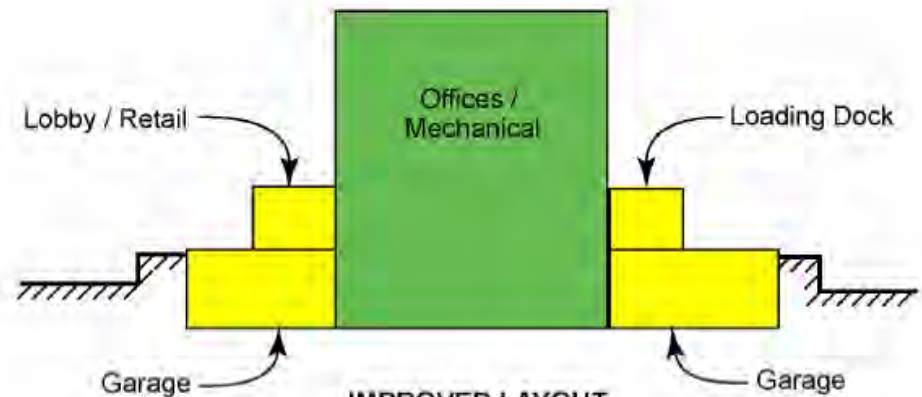
Do not mix high risk and low risk tenants in same building

Locate critical assets into interior of building

Separate areas of high visitor activity (unsecured) from critical assets



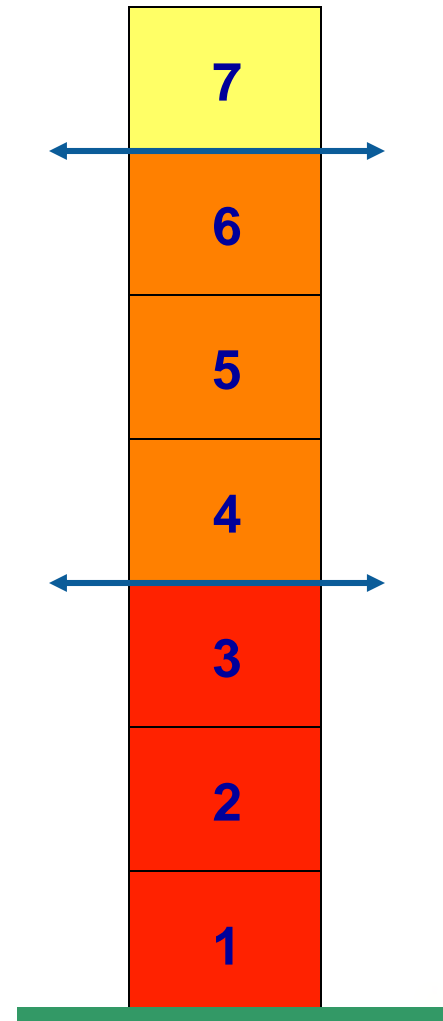
ORIGINAL LAYOUT



IMPROVED LAYOUT

Building Hardening

- If the design threat is considered larger, upper floors will need additional consideration
- Above the sixth floor, only conventional construction will be necessary
- At the fourth through sixth floor, the hardening can be reduced.
- The hardening of the first three floors is critical.



Reference Documents

- **APA Policy Guide on Security**
- **NAOIP Interagency Security Committee and Department of Defense Protection Standards and Impacts for Commercial Building Developers, Owners, and Managers**
- **UFC 4-010-01 DoD Minimum Antiterrorism Standards For New and Existing Buildings**
- **GSA ISC Standards for Leased Space**

