

International Security Committee and Department of Defense Protection Standards and Impacts for Commercial Building Developers, Owners, and Managers

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Commercial properties are at the forefront of a significant change in how sites and buildings are selected, designed, built and operated for the federal government. Key to the change is the recent release and mandatory use of the Interagency Security Committee (ISC) Security Standards for New Federal Office Buildings and Major Modernization Projects, the ISC Security Standards for Leased Space (for non-DoD federal agency space), and the DoD Minimum Antiterrorism Standards (for DoD installations and leased space).

After the Murrah Building attack, the Interagency Security Committee developed guidelines for the design and protection of commercial office buildings leased or owned by the General Services Agency and other federal agencies. The DoD Minimum Antiterrorism Standards were developed from the lessons learned from the Kobar Towers and other attacks on primarily military type and DoD owned or operated facilities. Both the ISC and DoD standards have been used in interim form for the past several years, but in September 2004, the ISC standards were issued in final form, and in October 2004, the DoD Standards were issued in final form.

Manmade Threat and Levels Of Protection

The basis of both standards involve three key terms:

- Design Basis Threat
- Level of Protection
- Layers of Defense

While both the ISC and DoD standards focus on manmade threats, and use the design Basis Threat as the initial step and Layers of Defense (or zones) as the protection strategy, they approach the protection requirement with different perspectives and in different formats. The ISC standards are defined by the tenant mission, size of the building and number of employees. A building can have multiple Levels of Protection based on the risk by tenant or loca-

tion; the DoD standards are based on the Level of Protection to be provided for a given building. The ISC criteria defines the type of building damage that will occur and/or is acceptable without setting casualty numbers; while the DoD defines the acceptable level of building damage and number of casualties that are acceptable and likely to occur.

State of the Practice Design Guidance

To assist commercial building owners, managers, engineers, planners and the building science community understand these principals and the standards; DHS released a series of risk management publications and courses. The FEMA 426 Reference Manual to Mitigate Terrorist Attacks Against Buildings and E155 Building Security course is the primary document and course, with additional primers for specific building types such as the FEMA 427 Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks.

Key requirements in both standards is obtaining blast standoff distance and avoiding progressive collapse, securing or restricting parking and underground access, upgrading HVAC systems for Chemical, Biological and Radiological protection, and providing pedestrian and vehicle entry access control and screening. In urban areas, the ability meet the

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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 Offices 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) Buzzer Alarm w/Central Monitoring
III	151 - 450 Employees (Federal) Multi-Story Facility 80,000 - 150,000 Square Feet Moderate/High Volume Public Contact Agency Misc: Low Enforcement Operations Court Functions Government Bazaars	Inspectors General Criminal Investigations Regional/State Offices ESA 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) Buzzer Alarm w/Central Monitoring
IV	>450 Employees (Federal) Multi-Story Facility >150,000 Square Feet High Volume Public Contact High-Risk Low 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 III Profile and Agency/Mission Critical to National Security	Principal Department Headquarters	Agency Specific

requirements is constrained by the land cost, existing infrastructure, adjacent properties and tenants, and the Level of Protection that can be achieved.

Integrated Approach

The complexities of protection design require an integrated approach and input from dozens of design/engineering disciplines and construction experts. The process is most successful when the protection requirements have been defined before commencing the facility design. Another key to success, is that the protection requirements must be communicated regularly throughout the course of the project. Communication must begin early in the project as the protection requirements are being defined, and must be constantly.

The safety and security of the occupants is the most important requirements in the design process. Historically safety and security have focused on fire safety, building exiting, vertical circulation, etc. The commercial building owner, tenant, and operations staff have three mitigation options to meet the standards:

- Capital Infrastructure investment
- Capital Equipment investment
- Plans, Policies and Procedures

Often, a change in plans, policies and procedures can be the most cost effective and easiest mitigation. However, every building will require some level of investment in capital infrastructure and equipment.

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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 - most 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 - repairable. 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 7 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.

Figure 2 - ISC Standards and DoD Standards Level of Protection

Balancing Security & Openness

Designing welcoming and inviting facilities is one of the key objectives of the design profession. Facilities are more successful if they provide open and comfortable spaces for employees and visitors. Desirable comforts include; natural light, views to the outside, inviting entries and easily accessible common spaces. Designing for protection need not discard all of the important attributes of comfort and openness. Nor does successful protection design solutions resemble either fortresses and bunkers. We must find design solutions which preserve the notions of openness while providing safety and comfort to the building occupants.

A key concern is how to site buildings on the available land and



Figure 2 - Site and Building Layout

where to place tenants within the site and building. Should buildings be grouped by highest risk, clustered or dispersed? (Figure 2)

Minimizing Costs of Protection

Achieving the GSA and DOD

standards add cost implications to new and existing buildings. These added costs occur in the site, building structural systems, the building façade, the building mechanical and electrical systems and within the interior spaces. The costs of

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protection design can be reduced measurably if they are considered early in the design and engineering process. There are often several options for achieving the required level of protection such as sequential hardening. Building owners must decide and value engineer the most cost effective solution in both the short and long term.

The challenge for the industry is the uncertainty associated with constructing or renovating a building to meet the emerging manmade threat standards and codes, the possible contradiction in design and protection requirements, and the relationship between the standards and life safety codes. The commercial building inventory can be divided into 5 categories:

- Historical buildings that must be renovated at some cost

- 1970's and earlier buildings that may be at the end of economic life and/or will be fairly expensive to renovate to bring up to standards
- 2003-1970's buildings that have been designed or renovated to current life safety codes and may be able to achieve the new standards at some reasonable mitigation cost
- 2003-2010 buildings that are currently in design or less than 2 years old that can potentially meet the new manmade threat standards and new life safety codes at some reasonable mitigation cost and leverage All Hazards design
- 2010 and beyond buildings that will incorporate the new codes for progressive collapse, HVAC and fire system, parking, electronic security systems and shelter in place and will incorporate new materials,

designs, and systems specifically designed for all hazards (Figure 3).

Use and Application of Advanced Materials

Design professionals have developed innovative approaches for achieving levels of protection with the use of advanced materials. Materials such as Kevlar and carbon fiber have been successfully used to harden structural systems. Applications have included slab reinforcing, column strengthening, and facade hardening. Other advanced materials are showing potential for their use in building protection solutions.

Commercial Development and Leasing Challenges

The standards create numerous considerations for landlords including the following:

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

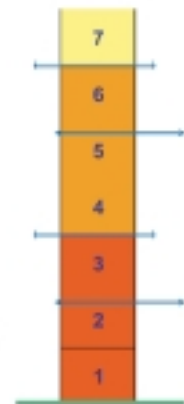


Figure 3 - Sequential Hardening of Building

- Security features must be priced and installed by the landlord and included in the tenant's base rent. Even if a government tenant is in occupancy, the standards (and associated costs) will take effect upon that tenant's lease renewal. The budget and finance implications of these costs should be anticipated early on.
- There will be cases where government tenants' security needs will require increased lobby and parking access control that will rankle private sector firms who share buildings. In some cases, the security standards may conflict with existing private sector leases. These situations will need to be analyzed carefully by landlords and investors.
- It is expected that increased security costs will be amortized

into the rent by property owners. This is likely to create situations where rents for government tenants are "above market," especially where the government tenant is not willing to sign a long term lease. These above market rents will need to be properly valued by investors and lenders because they may not be sustainable in future years once many competing properties have also been retrofitted to achieve the standards.

- Notwithstanding the above, many security costs are operational expenses (i.e. security guards) that will serve to increase property operating expenses. Landlords will need to develop strategies on how to apportion these costs in multi-tenant buildings.

The probability of renewing a

government tenant may decrease in certain instances. Heretofore, incumbent landlords normally enjoyed a significant pricing advantage in lease procurements because competing buildings would cause the government tenant to incur substantial relocation and replication costs. Security costs may easily eclipse these relocation and replication costs, thereby diminishing the incumbent's price advantage.

New buildings and substantial renovation projects will compete well with second generation properties even though the new buildings may be substantially more expensive. This is especially true of buildings that meet the DoD security specifications.

Given the unique site character-

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istics required to comply with the DoD standards, future DoD leases can be expected to have high renewal probabilities at above-market rents.

Community Impacts

The new standards present challenges for communities to implement. The Community Master Plan, the Economic Development Plan, Master Transportation plan, and the design submission process must all now account for the not just a single building, but all of the buildings within a block or region that will be required to meet the standards.

The immediate concern is the design and structural system changes necessary to comply and whether they will be so economically prohibitive that the asset

potential of the building is jeopardized. What if the site can not accommodate the setback and protective barrier requirements? Developers will question whether they should develop and where. Owners will wonder whether they should rethink decisions concerning renovation and rehabilitation. Defense contractors who need to be in general proximity to the contract source will wonder where they should lease office space: whether they should renew where they are or move and then to where, and how long a lease they should sign. The uncertainty of not knowing the degree to which these requirements will be enforced, whether there will be exceptions made or not and in what circumstances has the potential to be more devastating to the

building industry and to the local economy than the anticipated actual cost of their implementation, at least in the immediate future.

Communities must address a range of complex social issues to include the impacts on the retail tax base, change in commuting and transportation nodes and times, revision of planning and site plans to incorporate separate parking or control underground parking, and impacts on the streetscape. (Figure 4)

Any jurisdiction where there is significant federal presence should be concerned. In 2003 as a function of responsible economic forecasting, Arlington Economic Development conducted an extensive study of what effect its federal presence has on its economy: *The Federal Presence in the Urban*

Restrict parking from the interior of a group of buildings and away from restricted area

Locate parking within view of occupied buildings

If possible, design the parking lot with one-way circulation



Figure 4 - Impacts on Parking and Site Configuration

Village. For example, in 2002 the Department of Defense occupied 9.3 million of the 18.7 million occupied by all Federal agencies in Arlington out of its total 40.5 million square feet of office space. In that same examination, Arlington's 2002 share of federal procurement spending was \$3.8 billion of the DC Region's \$37.3 billion or 10.2 percent: the remaining 89.8 percent or \$33 billion being spent in other areas within the DC region. Most of this federal procurement has been through the DoD, which bought \$2.24 billion worth of goods and services from Arlington compa-

nies. Arlington's share of the region's total defense related contracting was 14.1 percent: the remaining 85.9 percent being contracted in other areas within the DC region.¹ If the same analysis was done for the entire state of Virginia it would likely show that these required standards could have a cumulative impact of hundreds of billions of dollars in Virginia: some 150,000 direct jobs, a payroll of at least \$9.3 billion.²

Conclusion

The new standards present chal-

lenges and uncertainty, but over time, the intent and objectives will become as commonplace to the community as the introduction of the seismic, life safety, and ADA requirements as when they were first introduced. The developers, designers, owners and operators will begin to accumulate the cost and design data to develop and build properties with seamless and invisible security that will ensure the long-term safety to the building occupants from all hazards, and provide the work and living space the public demands. ■

¹ Source: Arlington Economic Development; The Federal Presence in the Urban Village: The Economic Impact of Federal Facilities in Arlington, Virginia; December 2003. www.arlingtonvirginiasusa.com/docs/federalpresence.pdf

² Source: Consolidated Federal Funds Report (CFFR) for Fiscal year 2003 issued September 2004; U.S. Department of Commerce

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