AIA Best Practices:
Building security by design

Contributed by Joseph Brancato, AIA

Summary

Architects can do little to diminish the potential risks inherent in a building facility. However, they can develop design solutions that address security requirements and integrate security into the overall building design. Architects may apply the same creative design skill to controlling risks and integrating security that they do to creating attractive buildings and addressing other design challenges. Design solutions should thoughtfully balance security, openness, and cost. The following are some of the basic elements to consider when integrating security into building design.

Layering

Think of a building as a series of concentric layers or security zones, and consider the security level required for each. Concentrating the assets in greatest need of protection in a core area may be more cost-effective than trying to protect those assets in multiple areas. Perimeter security is common when a standoff distance is required.

Blast standoff distance

Security perimeters may be enlarged to decrease the likelihood and severity of damage from a bomb blast, particularly from vehicle bombs. The greater this standoff distance, the less hardening a building may require. Effective standoff distances are easier to achieve when integrated into the original design and construction. In dense urban areas, safe standoff distances are nearly impossible to achieve, necessitating other security measures.

Building hardening

When a standoff distance cannot be achieved to protect against potential blast threats, another option is to harden the building. This can be accomplished with greater building mass (concrete), by incorporating fewer windows, and by strengthening the structural system. Windows may also be designed with a blast curtain that absorbs the force of a blast rather than resisting it. Such curtains diffuse the blast and trap glass shards before they can reach the building occupants.

Landscaping

Landscape architecture can play a vital role in providing natural, unobtrusive security protection—not only by directing people to appropriate entrances but also by incorporating physical barriers between vehicles and buildings. Planters and bollards may protect building entrances while enhancing the appearance of a facility.

Parking

A parking garage may be one of a building's most vulnerable areas. While most government parking garages limit access to employees and limit truck access to designated areas, most commercial office buildings allow fairly open access to parking. Requiring employee badges for entry, restricting self-parking to employees only, and limiting access for large vehicles are among the possible solutions.

Access control

Access control involves limiting the number of building entrances and requiring keycard access to elevators and tenant spaces. Suburban facilities tend to focus on exterior access control, while urban facilities tend to focus on interior access control. Among the variables to consider are the size of the building, the volume of pedestrian traffic, vehicle access and proximity, the existence and location of loading docks, and the availability and location of parking.

Space planning and adjacencies

Early and thoughtful space planning can protect key functions or areas. The least critical facilities can be located in the least secure areas or zones, and areas such as noncritical storage spaces may be placed between parking garages and mechanical or electrical equipment. Size and space requirements for security equipment or procedures are often overlooked. Whenever monitoring, explosive detection, or inspection equipment is required, provide sufficient room for equipment, queuing, and clear segregation of people who have passed through the inspection point from those who have not. Space may also be needed for security command, control, and communication centers.

Segregation of functions

Mailrooms, entrance lobbies, loading docks, or other areas where packages are delivered may be physically segregated from the rest of a building to protect the occupants from dangerous packages. In addition, such areas may have to be environmentally segregated (designed with separate heating, ventilating, and air conditioning systems) to prevent the diffusion of airborne contaminants throughout the building.

Places of refuge

To comply with the Americans with Disabilities Act (ADA), design areas of refuge where disabled persons may safely congregate to await evacuation.

High-rise buildings

High-rise buildings pose special security concerns, especially related to evacuation. In designing high-rise structures, U.S. architects and building owners may look to Asia, where building codes are often more stringent, even if it means sacrificing leasable space. The 101-story Shanghai World Financial Center, designed by Kohn Pedersen Fox (KPF), provides a fireproofed refuge floor every 15 stories to buy time for evacuees in an emergency. Dedicated elevators in the core allow firefighters to ascend the building quickly without interfering with the exodus of occupants.

About the contributor

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This article corresponds to:

Architect's Handbook of Professional Practice, 15th edition Unit 1 - The Profession
Chapter 10 – Design Project Management
Section 05 – Design Phases