

ATLAS SAFETY & SECURITY DESIGN, INC.

COPING WITH THREATS, FROM BOMBS TO BREAK-INS

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First the World Trade Center, then the 1995 bombing of Oklahoma City's Murrah Federal Building, which killed 168 people. The Unabomber still lurks somewhere out there. Should such rare but devastating acts drive the design of buildings? However you answer, no building security issue is easy. Terrorists have gassed subway passengers in Japan and exploded bombs in Paris' Metro. And today's threat may not be tomorrow's. Take the Murrah building. "It was supposed to be bomb resistant," acknowledged James Loftis, one of its architects, at a conference on building security held last November in Washington, sponsored by AIA and the McGraw-Hill Companies [RECORD's parent]. "The pipe bomb was the weapon of choice in the early 1970's - it was the Vietnam era." Still, the chances of a large-scale terrorist attack remain low. Much more likely are everyday criminal acts.

Until recently, architects have been wary of what they perceived as the "bunker mentality" of security consultants. Security consultants say they are stymied by architects' resistance to integrating security considerations early enough. Many of the same measures employed to make a building safe from criminals will help secure it from terrorist attacks, according to industry experts. More and more architects and owners are turning to security consultants and professional associations to enlighten them about crime prevention through environmental design (CPTED) Based on

defensible-space concepts, CPTED principles are used to analyze the physical design of the project to avoid or reduce crime opportunities. The strategy is threefold:

1. Natural access control to limit entry (and in some instances egress) and to establish a perception of risk to potential offenders.
2. Natural surveillance to observe intruders.
3. Territorial reinforcement through easy identified boundaries.

When the built environment itself succeeds in deterring crime, the owner needs to invest less in detection, control, and intervention systems and staff. Poor security planning not only fails to limit crime but can even be responsible for beckoning it, thus increasing the inherent risk. Access-control techniques range from the 100-ft building setbacks and high walls of some recent embassies [RECORD, August 1992, page 339] to concrete bollards that prevent a disgruntled employee from ramming a vehicle into a lobby. (It's happened). Parking structures can keep out unwanted users through key-card access (and keycards can also identify users); key cards for elevators in the soon-to-open American Association for the Advancement of Science headquarters in Washington not only open elevators, they direct users to a preset floor. Since the World Trade Center bombing took place in a garage under a building, owners have reassessed auto access. For fear of bombs, parking was discontinued in the garage that reaches across the length of the National Air and Space Museum.

Negotiating threats and risks

CPTED philosophy requires realistic threat analysis because fitting security measures into an already designed or built building can add excessive costs and drive fortress-like solutions. "When I can give my input about threats, vulnerability, and assets to protect the programming stage," says architect and criminologist Randall Atlas of Atlas Safety & Security Design, Miami, "it becomes design guidelines." If the architect takes advantage of security planning resources early in the project, Atlas says he can keep control of costs. Image is not the only thing at odds with security. Accessibility, energy conservation, and code requirements for life safety and fire can also conflict with building-security needs.

Local authorities and code officials may undermine the best-laid security plans if they perceive a threat to life safety in an emergency. The architect and security consultant went to officials early for a new building completed for Canada Life Insurance Company. "To avoid problems with the fire department and local inspection authority, potentially problematic design elements were reviewed before the overall design was completed," says Nick Hatzis, senior consultant with Intercom Security, Chicago. "We showed him how people would be moved in and out, where fire doors were to be located, and what the safety backups were." This situation points to the key role

architects can play: achieving consensus on the nature of threats and the measures that will be taken to prevent or deal with them.

Sometimes, for example, owners' decisions can seem draconian. At the North Terminal, under construction at Washington's National Airport made to designs of Cesar Pelli & Associates, "The client required that we examine what they classified as crisis-level security strategies," explains Phil Bernstein, Pelli's project manager. "We looked at restricting airport usage to passengers and employees only and conducting initial screening of these persons at security checkpoints and x-ray stations located at all building entrances." Though such a restrictive policy was not accepted, the airport authority nevertheless instructed the designers to include cable chases for extra power at these locations, "just in case."

Hide security measures or flaunt them?

"In a federal courthouse," says Bernstein, "the problem becomes much more complicated." Differing levels of security must be accommodated for the building's three circulation patterns - for judges, staff and public, and prisoners. At the same time, the designers must resolve life-safety issues for all three user groups, convey the dignity of the judiciary, and make the project feel part of the community.

Flaunting security where risk is perceived as high can be effective . Other owners choose to obscure security measures for fear that perpetrators can overcome visible measures.

Designers and clients must also consider unintended consequences, observes Stuart Knoop, of Oudens & Knoop Architects, Chevy Chase, Md. His firm has a special expertise in embassies and other high-security buildings. "Once you erect barriers or other controls on a building, it clearly becomes hardened-more risky for a criminal to attack. That can cause the attacker to go to an easier target."

Building occupants can subvert security measures, says Knoop. Where secure areas are divided by floors, "fire stairs shouldn't be used as convenience stairs to move from level to level," he explains, "because that allows unrestricted movement through a building."

The Human Factor

Understanding the risks involved, agreed to by all parties, is a starting point for design, says Intercon's Hatzis. Then his firm looks at the requirements of the user and what assets need to be protected. "There are many options," says Wilbur Rykert, director of the National Crime Prevention Institute, Louisville. "The building owner or operator just

needs to be educated, and there are no standard solutions because each building is physically unique."

One of the toughest issues is use of guards. Mark Shoemaker, design-team leader for Cesar Pelli's office at National, acknowledges that guards are a "design factor" if they need podiums, desks, or storage facilities. More importantly, "the presence of guards is a management issue." It's not just salaries. Rykert explains, "Guards get bored, they fall asleep, they take vacations. A closed circuit television (CCTV) is much better. Other owners tell me they can have someone watch a TV all the time for many of the same reasons." Technology can overcome some of these human frailties, such as periodic, random computer monitoring or devices that beep audibly when someone enters a space.

Though security technology is a necessary evil, security equipment need no longer evoke "big brother is watching". Closed circuit TV cameras are now as small as 4 to 5 inches; access-card readers can be installed behind drywall, wood, or glass.

To reduce the need for guards and technology, a CPTED strategy will take advantage of as many architectural elements as possible. Appropriate lighting, landscaping, and surveillance opportunities are particularly important on college campuses and in parking structures that people may use alone or late at night. "Surprisingly, few parking structures meet current lighting criteria," according to Mary Smith, a security expert with Walker Parking Consultants of Indianapolis, "even though 8.5 percent of violent crime occurs in parking facilities." Other CPTED strategies include open or glassed-in stairs and elevators, open, clear plans with as few columns, walls, and other hiding places for criminals as possible. Site plans should focus pedestrian activity rather than disperse it. A building amenity can become good defensive architecture. A high-tech learning center will adjoin the library at Temple University, in Philadelphia. Because the building will be in operation around the clock, the Philadelphia office of Bohlin Cywinski Jackson arranged study areas around an open atrium that connects all floors. The light-filled space is not only a celebratory beacon to the campus at large, it gives clear visual field across all floors and offers attractive gathering places.

In security design, there's no one-size-fits-all approach. That frustrates designers, says Hatzis. "Architects ask me to give them a place to start, but there is none. We have to start from zero each time." There's no "bible" of CPTED, no minimum standards about what entry points should be controlled, what kind of vertical control for visitors and tenants is necessary, or even what controls should accomplish, he says.

Designing for the worst case

Knoop designed the U.S. Embassy in Somalia which in 1989 had only been occupied

for a few months when the government collapsed, provoking an uprising. "It was one of the first buildings that complied with the Omnibus Diplomatic Security and Antiterrorism Act of 1986," explains Knoop, "which required 100 feet of stand off distance between embassy buildings and any unsearched vehicles." The compound was successfully evacuated by helicopter.

"At an abortion clinic," says Rykert, "you can't have people walking in off the street, even though this philosophy is at odds with the intended purpose of such facilities and of the people who work in them." Such a dilemma faces a number of groups, according to Bruce Hoffman, a security expert at St. Andrews University in Fife, Scotland. The Murrah Building was apparently targeted in retaliation for deeds done by the Bureau of Alcohol, Tobacco, and Firearms; other targeted groups have included the Internal Revenue Service and Jewish community organizations. It is not out of the question.

information has been collected on the effects of blasts on military facilities. Although less is known about the performance of office buildings, "there is sufficient knowledge and technology available to assist skilled designers in developing structural systems to resist at least some of the effects of a blast," says Knoop. Lorrion's Massa has developed BombCAD, an architectural analytical security tool that estimates a building's blast vulnerability and helps to plan its defense.

Unless the world becomes a much safer place, the decision as to how much security is needed will remain difficult. "The point is," says Rykert, "to use the least amount of security, restricting operations as little as possible and still protect people, property, and premises."

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