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ELEMENTS OF CAMPUS SECURITY DESIGN GUIDELINES

The following is a summary of the principle security-related issues that should be addressed in a campus design manual:

- *Introductory Issues*

  The introductory issues should include a discussion of what the manual is to include and how the document should be used by the Architect and other design professionals involved with the project. It should address the organization of the manual, and illustrate what are the expected results at each stage in the design process. Of particular relevancy is the Owner's expectation as to what submittal documents are to be offered at each stage and an expectation that each phase submittal will include a text description as to how the architect achieved certain objectives.

  The "Agreement Between the Owner and Architect" should indicate a responsibility to ensure compliance with these or any other institutionally-generated design standards or guidelines or provide reasoning in advance why compliance cannot be accomplished. In addition, the architect or the facilities department should ensure that the campus protection agency has been provided with submittal for review and comment at each stage of the design process.

  - Situations Requiring Added Protective Measures

    The guidelines and standards contained in the document represent minimum requirements for all new buildings projects at the University. There may be circumstances however, where the nature of the building activities or occupants warrant additional protection measures. Design professionals should be cautioned to sensitive to such situations, some of the more common of which are listed as follows:

    - Where extensive after hours operations are expected, particularly involving students;
    - Where large amounts of cash or other valuable items are maintained;
    - Where clinical operations or patient treatments are to be conducted;
    - Where prisoners or psychiatric patients are treated, counseled or housed;
    - Where disciplinary counseling or other confrontational encounters are expected;
    - Where animal care or research facilities are involved;
    - Where select agents or chemical/biological materials are maintained;
    - Where required by insurance carriers;
    - Where required by regulatory agencies governing the activity intended to take place in the completed structure;
    - Where security "best practices" typical for buildings of the planned type are higher than the base security standards.

- *Crime Prevention Though Environmental Design (CPTED)*

Environmental design guidelines are based upon the theory that, "the proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, and an improvement in the quality of life." Guidelines in this category are intended to provide challenge to the design professional in the application of architectural strategies. They are intended to maximize opportunities for natural surveillance; to increase a sense of territorial control and identification of space; and to enhance natural access control. As previously noted, environmental design security provisions are immensely preferable to more traditional security approaches because they are intended to fulfill the two-fold purpose of providing security while also increasing the level of comfort and functionality of the space.

Environmental Design Guidelines are intended to be used during the programming and schematic design phase, since these directives tend to affect site planning, use of space and the positioning of major building components. They are general in their nature and intended to permit the design professional a substantial degree of latitude in how the objectives are accomplished.

Topics to include under this issue are:

- Building Site: How the building, and its entry points are positioned relative to parking lots, walkways and adjacencies to other facilities, including those that may create problems for the new structure (i.e. location relative to a public housing facility).
- Landscaping: The concept of "safe landscape" design should be addressed in both objective form and with specific references to the manual's landscaping sections to follow, including type of plant materials, their placement, density and height. Design standards for landscaping and plant growth should minimize areas of concealing cover for a potential attacker and maximize observation of areas by occupants and passing patrol personnel.
- Areas of Concealment: Eliminate publicly accessible interior and exterior areas of concealment. Areas of concealment include building alcoves, areas beneath stairwells, ornamental architectural features and dense shrubbery that could permit concealment. Particularly noteworthy are those areas that are close to entry doors and windows that offer concealment of an intruder while attempting a burglarious entry.
- Fencing and Barriers: Fencing and similar "breachable" barriers (i.e. plant materials) may be used to provide a physical barrier to unauthorized access or as mechanism to define and demark limits of exterior space. Exterior fencing, such as ornamental wrought iron fencing, can also be used to channel or direct persons to appropriate walkways or building entry points.
- Exterior Access To Above Grade Entry Points: The building, its landscaping and proximity to other structures should be such that it is not possible to access upper less protected floors or a roof. This may not be possible in some locations where the building must be placed adjacent to another structure. If this is the case, then additional protections for the upper floors becomes necessary.
- Way-finding: Wayfinding is an important element of both interior and exterior design. Simply put, it should be easy to locate the structure, the particular entrances to be used (and not used) and the specific destination space within the building. This issue takes on even greater significance when the building to be designed has multiple occupant types (i.e. open to both members of the institution and the public) or has diverse uses (i.e. offices and classrooms). Wayfinding is a function of proper locationing of space and entry features, and visual cues such as symbolic architectural features and directional signage.

- Blast/Biochemical Attack Resistance: Although not exactly an environmental design issue, the ability of a building to withstand the detonation of an explosive device or resist an intentional biochemical attack by a terrorist organization or individual is clearly an issue which impacts the structure in significant ways involving many design disciplines. Clearly, there are few buildings on a college campus that would necessitate such measures; but they do exist. Common among such facilities risk are research buildings, particularly if the research is controversial or involves defense-related grants and contracts. Other buildings housing special offices or even VIP's (including foreign dignitaries) may also be at risk for such attacks.

  The design standard must indicate a requirement for such features when certain specific threats are found to exist. The "tools" available for this vary from exterior bollards and crash barricades, to special protections for glass curtain walls and special hardening or weakening of interior and/or exterior wall surfaces. In some cases, government standards may exist for specific type of facilities. In any event, there should be a designated person within the institution (or outside the institution) to determine if such a threat exists and assist in defining what measures should be implemented to first prevent such incidents and second to mitigate the damage caused by an explosive or biochemical incident.

- Perimeter Entry Points: The location and position of perimeter entry points are important to the issue of natural surveillance and natural access control. Highly visible entry points promote their own use by legitimate users of the building and are easily surveilable by security or public safety personnel. Conversely, there may be potential entry points that -- because of their location in a concealed area -- should *not* be used. In such cases, it is desirable to use architectural and/or electronic mechanisms to essentially eliminate these doors from use except during an emergency.

- Safe and Unsafe Areas and Activities: Place unsafe activities (such as restrooms, ATM'S, etc) in or near safe locations (such as lobby desks, reception areas, active building lobbies) to bring along the natural surveillance and to increase the perception of safety for normal users as well offenders. Safe activities serve as magnets for normal users who exhibit challenging or controlling behaviors (e.g. staring) that tell other normal users that they are safe, and that tell abnormal users that they are at greater risk of scrutiny or apprehension.

- Common-Use or Shared Space: Within a building there are a number of areas that are shared or common spaces that are used by many departments. In office buildings this may include conference rooms, copy centers, break rooms. Lab facilities could require common chemical storage rooms, animal resource areas or glass washing areas. In such cases, these common or shared spaces should be positioned within the structure in a way that provides a common entry, without the need to enter another individual assigned space. For example, to access a common conference room shared among several different departments, the entrant should not be required to enter the space of an adjacent department.

- After Hours Operations: If the building will house offices or spaces with differing operating hours, the design should permit the areas independently secured. This objective is not accomplished by locks on office doors; rather it is satisfied by arranging space to permit entire sections of the building to be closed or isolated. For example, in a structure containing offices that close after 5:00PM and classrooms that remain open until 10:00PM, the offices could be located at one end of the building. The office section of the building could be locked at 5:00PM while the remaining portions of the building remain open. Where a 24hour computer lab is required, the lab could be located on the perimeter of the building, where entry could be achieved directly at grade; and after hours, one or more doors into the lab from remaining portions of the building would lock, thereby allowing the lab to function autonomously.

One caution is in order: If a space is to be separated and run autonomously from other parts of the structure, restrooms -- and in some cases, vending areas and other support facilities -- must be essentially duplicated in the section allowed to remain open.

- Specific Areas Concern: Specific security provisions should be developed and specified for certain areas. These areas should be the subject of specific focus since the strategies for protection are fairly well established among crime prevention practitioners. The list below is indicative of some of the more common areas found in a campus environment:
    - Parking Lots
    - Bicycle Parking
    - Building Lobby Space
    - Elevators
    - Stairs Systems
    - Vending Areas
    - Building Restrooms
    - High Risk Classrooms (with significant AV Support)
    - Computer Labs
    - AV Storage Spaces
    - Retail Space
    - Cash Handling Areas
    - Precious Metal Storage
    - Chemical Storage
    - Music Practice Rooms and Similar Spaces
    - Laundry Rooms
    - Study Rooms

- *Specific Design Issues*

The strategies in this category tend to be more specific in nature-- relating primarily to locating and configuration of certain specific elements or components of a project. These guidelines assist in the design effort by indicating certain "standard" security provisions (i.e. duress alarms in reception areas and restrooms, designating electrically controlled doors, door type selection, etc.) and defining options which the Architect may employ to satisfy the security objective. Minimum security provisions applicable to all risk situations should be defined; however, certain higher risk situations will require levels of security that may not be articulated in the document. Where such conditions exist, the campus protection agency or outside consultant should provide additional requirements.

General Design Directives are intended to be reviewed and incorporated into the design process primarily as the project moves into the design development stage and during the early construction document phase. The guidelines in this section should be developed around a standard method such as the 16 Division "MasterFormat™" specification produced by the Construction Specifications Institute. This method permits the architect and his design team an easy method to determine any security requirements within each design discipline.

Listed in the table following, are these 16 divisions, along with the security issues involved with each.

Division	Division Name	Possible Security Guidelines Requiring Development
1	General Requirements	a. Coordination between security and other contractors b. Project meetings w/security contractors c. Security submittal documents d. Protections for construction site e. Substitutions relating to specified security products f. Security issues related to building start-up and commissioning
2	Site work	a. Protection of manholes b. Access to exterior power and communications disconnects and vaults c. Access to exterior water and gas utility disconnects d. Fencing use and general design e. Landscaping species selection and specific design criteria for safe landscapes f. Design and selection of bicycle racks, picnic tables & other site furniture.
3	Concrete	a. No general application for security guidelines
4	Masonry	a. No general application for security guidelines
5	Metals	a. No general application for security guidelines
6	Wood and Plastic	a. No general application for security guidelines
7	Thermal and Moisture Protection	a. No general application for security guidelines
8	Doors and Windows	a. Secure door design criteria (including specialty doors, ADA door design and the use of “standard” products). b. Door hardware selection and application criteria for different situations. c. Keying requirements d. Coordination of hardware with electronic security systems integrator. Division of responsibility. e. Acceptance testing of door systems f. Special doors (i.e. bullet/blast resistant) and when and where to use. g. Secure window design criteria, including which windows should be protected. h. Specialty windows (i.e. bullet/blast resistant)
9	Finishes	a. Vandal resistant finishes
10	Specialties	a. Locations of louvers and vents, particularly intake air vents where there is a potential for the introduction of biochemical agents. b. Construction of louvers and vents to withstand intrusion and attachment of devices. c. Metal lockers, security criteria and locationing issues. d. Use and application of turnstiles
11	Equipment	a. Parking equipment, including when and where to use parking gates and related devices. Design criteria. b. Barrier devices, including when and where such devices should be deployed. c. Mail room equipment (for opening and inspecting mail) d. X-Ray equipment. When and where required.

Division	Division Name	Possible Security Guidelines Requiring Development
12	Furnishings	a. Design of ash and waste receptacles to resist their use as door propping devices b. Design of waste receptacles for blast resistance and where such receptacles are required. c. Requirements for furnishings in specific spaces such as residence halls and lobbies to reduce vandalism or use by indigents d. Rugs and Mats. Avoid mats that can be used as propping aides.
13	Special Construction	a. As required
14	Conveying Systems	a. Requirements for interconnection with security systems. b. Vandal resistant construction criteria. c. Design for safety (i.e. mirrors on wall; transparent wall surfaces)
15	Mechanical	a. Locationing of gas and water piping in relation to critical building spaces such as server rooms, electrical equipment, etc. b. Locations of critical cutoff points and control of access to these points. c. Locationing of main gas lines in relation to parking areas and publicly accessible points in the building. d. Air balancing as it relates to ensuring doors is not held open due to excessive positive building pressure. e. Requirements for emergency shutdown, including any special requirements for auto-cut off for earthquakes. f. Requirements for air handling systems in the prevention and distribution of contaminants g. Requirements for fire suppression systems (i.e. sprinklers).
16	Electrical	a. Security requirements for basic materials and methods used in electrical systems. Special marking requirements for circuit breakers and wires. b. Emergency power generation requirements. c. Service and distribution electrical equipment, particularly locationing and security of panels. d. Exterior lighting requirements including campus standard for illumination levels, fixture selection and control of lighting. e. Interior lighting requirements including campus standard for illumination levels, fixture selection and control of lighting. f. Requirements for electronic security systems including access control, CCTV, and alarm systems and intercoms, including when and where they should be deployed. g. Requirements for any building emergency campus notifications systems (this may also be related to fire alarm systems). h. Requirements for emergency call box systems including locations and numbers and general design criteria.

- *Guide Specifications*

Construction documents developed by the Architect include a detailed description of the products and installation methods to be used on the project. The guide specifications

provided in the design manual intend to remove some of this responsibility by providing Owner-generated specification text for direct inclusion in the project manual. Although some campus facilities personnel may be reluctant to engage in such activity, properly developed Owner-provided specifications better ensures greater uniformity among projects and compatibility with existing systems and ways of doing things. They are also an excellent method to convey specific manufacturers and model numbers of devices used for security applications. The specifications however, should be written in general conformance with an industry-recognized standard format in order to be included in the construction documents (such as the CSI MasterFormat™) and should be the subject of close scrutiny by the architect's project specification writer to ensure they are tailored to the specific project at hand.

The guide specifications may take two forms: as insert text for specific products and installation methods; or as whole and complete sections intended for direct insertion into the project specification. In either case, the writer needs to be intimately familiar with the technical issues involved and how these issues may vary from project to project.

Guide specifications are intended for use during the Construction Document phase of the design process.

- *Typical Drawing Details*

The final issue to be addressed in the design manual relates to drawing details provided to the architect for inclusion in the project and use on his drawings where required. Like the general design issues, these details should also be numbered or indexed in accordance to recognized drawing standards (i.e. A-xxx for architectural; M-xxx for Mechanical; E-xxx for electrical; X-xxx for security-systems, etc). In addition, the drawings should be developed using AutoCAD or similar architectural graphics software using layers and scales consistent with these recognized standards.

IN CONCLUSION

The development of appropriate security design standards for campus capital construction projects can be a time-consuming task. It is also one that requires a significant amount of professional and technical knowledge. Security design standards must be tailored to the unique risks, threats, physical environment and culture of each college or university. They cannot simply be "boiler plated" from other manuals or past projects. The design and implementation of the standards should be accomplished by a campus committee and a design professional working with a skilled campus crime prevention specialist or a qualified consultant and they should be frequently reviewed to maintain relevancy to the times. After each project is completed, the final building should be compared against the campus standard to gauge compliance and to make adjustments in the standards that will impact future projects.

It is important to bear in mind that most campus buildings are designed to last for 50-100 years. The security standards incorporated into their design, therefore, will influence the protection of the buildings, its property and occupants for decades to come.

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