

School Fencing: Benefits and Disadvantages

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In the following report, Hanover synthesizes research on school fencing to support school district planning for the installation and repair of fencing around school grounds and play areas. The report discusses both the advantages and disadvantages of fencing as a school safety measure and the relative merits of different types of fencing for school campuses.

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EXECUTIVE SUMMARY

INTRODUCTION

Growing concerns over safety in U.S. schools have led many districts to consider the implementation of new, more stringent security measures. The use of fencing to bolster campus security – often as part of broader safety plans – has become a key issue in discussions of school safety.¹ The National School Safety Center highlights control of campus access as a central dimension of strategic school preparation,² and proponents argue that campus fencing can “not only provide adequate protection, but” – assuming strategic budget allocation and effective planning – can “also be aesthetically pleasing.”³ Opponents argue that fencing can contribute to an unpleasant environment for children, and may not be fully effective in deterring security breaches.⁴

In this report, Hanover Research examines the fencing school grounds and play areas, to support school district planning for the installation and repair of fencing. The report comprises two sections:

- **Section I** relates school fencing to the principles of Crime Prevention through Environmental Design (CPTED), a research-based design methodology, and presents the advantages and disadvantages of fencing as a safety measure.
- **Section II** provides more detail on the fencing of school perimeters and playground areas, including a discussion of different types of fencing materials, drawing on information provided by education agencies and security organizations.

¹ See, for instance:

[1] Hoffman, S. “Safety Fence Approved for Monticello Schools.” *Piatt County Journal Republican*, Apr. 23, 2013. <http://www.journal-republican.com/news/education/2013-04-23/safety-fence-approved-monticello-schools.html>;

[2] Angel, N. “Higher Fencing, ID Badges Part of New School Safety Plan.” *TurlockJournal.com*, June 7, 2013. <http://www.turlockjournal.com/section/17/article/20432/>

[3] Kelly, D. “After Sandy Hook, Schools Start the Year with Heightened Security.” *Los Angeles Times*, Aug. 11, 2013. <http://www.latimes.com/news/local/la-me-school-security-20130812,0,4594501.story>

² “Schools and Readiness.” National School Safety Center, 2010. <http://www.schoolsafety.us/free-resources/schools-and-readiness>

³ Willingham, B. “Schools Don’t Need to Feel Like Prisons.” *Campus Safety*, May 1, 2007.

<http://www.campussafetymagazine.com/Channel/School-Safety/Articles/2007/05/Schools-Dont-Need-to-Feel-Like-Prisons.aspx>

⁴ See, e.g., Ron, J. “Rethinking School Safety in the Wake of the Connecticut Massacre.” *MinnPost*, Dec. 16, 2012. <http://www.minnpost.com/community-voices/2012/12/rethinking-school-safety-wake-connecticut-massacre>

KEY FINDINGS

- **Properly selected fencing presents several safety advantages.** In particular, appropriate fencing supports the security-enhancing principles of the Crime Prevention through Environmental Design framework by:
 - Designating the school grounds as a well-defined, carefully maintained space that deserves respect
 - Enabling surveillance by school staff and law enforcement
 - Limiting access to areas that are not highly visible
 - Restricting entry and exit points to a few easily monitored areas
- **Poorly chosen fencing may reduce or negate any intended security benefits.** Inappropriate fences may pose threats to safety in several ways:
 - Limiting surveillance of school grounds
 - Attracting graffiti and other vandalism that diminishes the respect accorded to school property
 - Restricting access so much that students must take more hazardous routes to and from school
- **Fencing needs should be determined on a school-by-school basis, as all sites have different security needs.** School security teams can help to evaluate weaknesses in existing perimeter and playground fencing and determine the need for additional fencing.
- **Fencing material should not be easy to vandalize, cut, or climb; ornamental fences, such as wrought iron, are considered to be the best in these cases.** High quality ornamental fences are also low-maintenance, which saves money over the years. While chain-link is often the most economical option, it is easy to climb and vandalize.
- **Perimeter fencing should include at least two points of entry, in case one is blocked during a crisis.** Additional access points should be considered if students would be potentially in harm's way circumnavigating an uninterrupted fence line. Access points should be wide enough for grounds maintenance and emergency vehicles.
- **Playground fencing promotes student safety and helps to define separate spaces for different age groups.** School staff can easily monitor playing children and children cannot inadvertently leave the playground. Playground fencing should be non-toxic and have access points that are wide enough for an emergency vehicle.
- **Fencing should try to create a balance between aesthetics and security, as allowed by the budget.** The aesthetics of fencing has been a point of contention in several communities where schools proposed or adopted fences. Plantings, so long as they do not obstruct the ability to monitor school grounds, can create a more pleasant fence line.

SECTION I: THE ROLE OF FENCING IN SCHOOL SAFETY

In this section, Hanover situates the use of fencing within the context of school safety. Specifically, we relate fencing to the principles of Crime Prevention through Environmental Design (CPTED), a design framework frequently referenced in literature on school safety.⁵ In addition, we present the advantages and disadvantages of fencing as a safety measure. The discussion in this section provides context for the discussion of fencing selection in the second section.

FENCING WITHIN THE CPTED FRAMEWORK

CPTED is a research-based design methodology that seeks to create “a climate of safety in a community by designing a physical environment that positively influences human behavior.”⁶ While originally employed to deter criminal incidents in public housing, the methodology is currently used to improve security in a variety of structural spaces, including schools.⁷ CPTED is based on three central strategies:

- *Territoriality*: Using buildings, fences, pavement, sign, and landscaping to express ownership
- *Natural surveillance*: Placing physical features, activities, and people to maximize visibility
- *Access control*: The judicious [sic] placement of entrances, exits, fencing, landscaping, and lighting.⁸

As we explain below, fencing is an integral aspect of each of these strategies in considerations of safe school design.

TERRITORIALITY

Fencing may function as a key element of territoriality, the use of architectural and landscape markers to distinguish ownership of a space. When discussing security in schools, the Department of Homeland Security (DHS) observes that territoriality extends to the upkeep of campus grounds, as users tend to treat well-maintained buildings and grounds with greater respect. Consequently, **maintaining property line markers such as fencing,**

⁵ See, for instance: McLester, S. “Designing Safe Facilities.” *District Administration*, Sept. 2011. <http://www.districtadministration.com/article/designing-safe-facilities>

⁶ “Crime Prevention through Environmental Design Training Program.” National Crime Prevention Council. <http://www.ncpc.org/training/training-topics/crime-prevention-through-environmental-design-cpted->

⁷ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*. Department of Homeland Security. Jan. 2012, p. 2-17. http://www.dhs.gov/xlibrary/assets/st/bips07_428_schools.pdf

⁸ Bulleted points quoted verbatim from: *Ibid.*, p. 2-18.

other architectural features, and landscaping **may serve to establish ownership of school grounds and increase respect of school property.**⁹

In its guidelines for designing safe schools, the Florida Department of Education echoes the DHS's remarks on the role of fences in supporting territoriality. The department notes that perimeter fencing helps a school to establish ownership by defining tangible perimeters. Clear ownership, in turn, encourages responsible use of the land by the public. The department's guidelines emphasize that clearly established property lines and a well-defined perimeter are critical signals of a school's active concern for its grounds:

Fencing helps schools to establish ownership and to define tangible perimeters, encouraging responsible usage of land by the public and minimizing "unowned" space.

The site perimeter ... defines the initial impression of a school. How a school's site design responds to its immediate surroundings is evident in its treatment of its perimeter and edges. These edges communicate to the public messages of accessibility or inaccessibility. Therefore, a primary consideration in school site design is the clear definition of the school property lines. This definition can be achieved by utilizing layered edge treatments such as fencing, landscaping, and ground surface treatments.¹⁰

According to the California Department of Education, territoriality has implications beyond perimeter enforcement. By delineating the boundary between private property and public space, a school's fence can also serve to "create a sense of belonging or community."¹¹ This effect may help to increase community support for school fences, which, as we discuss below, is not always strong.

NATURAL SURVEILLANCE

Schools also may employ fences to maximize natural surveillance, or the ability to easily keep watch over school grounds and monitor the flow of individuals into and out of the campus. In setting out guidelines for natural surveillance, the DHS cautions schools to ensure that there are no hidden areas on the school grounds, and also emphasizes that fencing should be placed strategically so as not to obstruct lines of sight. Other elements that may conflict with natural surveillance include "solid walls, tall shrubs, parked cars, outbuildings, sculptures, [and] large signs."¹² However, schools can mitigate some obstacles to surveillance through appropriate fencing choices. Schools can increase visibility by installing openings or windows in solid walls, for instance, or by "replacing solid walls with

⁹ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. F-3.

¹⁰ Ibid.

¹¹ "Design Considerations for Safety and Security in Public Schools." California Department of Education (CASH Workshops), June 2013, p. 8.

http://www.cashnet.org/meetings/2013_Workshops/documents/Waters_Safety_Security.pdf

¹² *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. F-3.

wrought iron fencing.”¹³ Schools can also bolster safety through the use of fencing to block access to hidden areas.¹⁴

The Florida Department of Education’s Design Guidelines note that recreational areas pose unique safety concerns for natural surveillance, and that school administrators should take specific care related to “securing and limiting access points” around these areas. Fences around play areas should be constructed to as not to obstruct natural surveillance.¹⁵ Not only is this critical for school staff to easily monitor play areas, but it also facilitates the ability to monitor after-hours recreational use of these facilities.¹⁶

ACCESS CONTROL

Access control, a strategy closely related to both territoriality and natural surveillance, also places design constraints on fencing. **The design principles of access control on school grounds rely on physical barriers, such as fencing or landscaping, and the strategic placement of limited access points, such as gates, entrances, or exits.**¹⁷ Limited access points allow school personnel to monitor better the comings and goings of individuals during school hours. For example, the main entry to a school can directly funnel into administration offices, helping to monitor visitor access.¹⁸

The use of physical barriers such as fences and access points such as gates give school planners the ability to distinguish between exclusive and non-exclusive access zones. The DHS defines an exclusive access zone as the area around a school building “that is in the exclusive control of the owners or occupants: anyone entering an exclusive zone must have a legitimate reason.” Non-exclusive zones are public right-of-way areas around a school, such as sidewalks, streets, or specific parts of the school grounds that are open to use by the public after school hours.¹⁹ The distinction of such zones via access control reinforces territoriality and may facilitate surveillance.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ “Section 2 – Site Design,” Op cit., pp. 1, 10-11.

¹⁶ Ibid, pp. 10-11.

¹⁷ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op. cit., p. 2-18.

¹⁸ Ibid, p. 3-42.

¹⁹ Ibid, p. 2-27.

ADVANTAGES AND DISADVANTAGES OF FENCES IN MAINTAINING SCHOOL SAFETY

The foregoing discussion shows that fences may enhance school safety by supporting the three central CPTED strategies. Certain types of fences may provide further safety-related benefits. Solid walls or fences, for example, may provide protection against bullets; these types of barriers also may enhance privacy.²⁰ Short fences, while not effective in controlling access, can help to define ownership of a given territory.²¹ Furthermore, such fences can effectively demarcate a playground area or regulate pedestrian traffic, for instance.²² Similarly, hostile vegetation – dense, thorny groundcover or bushes – can be “used effectively to define boundaries of various kinds around and within school property.”²³

For all their benefits, **fences and similar barriers may undermine CPTED strategies when improperly selected and thereby diminish school safety.** A concrete wall, for instance, can increase safety and yet work against key design principles at the same time. While concrete creates an effective barrier, the National Clearinghouse for Educational Facilities (NCEF) notes that “a solid wall or fence blocks natural surveillance.”²⁴ In other words, solid barriers may create hiding places for intruders by obscuring certain locations from view. Additionally, a solid wall can attract graffiti, which can harm the image of a well-maintained school and invite other acts of vandalism.²⁵ Given the important signals conveyed by the appearance of a fence, the Florida DOE stresses that any material chosen for school fencing should not be easy to vandalize.²⁶

Fences may also create safety hazards for students. Tall, continual fencing can block student pathways, forcing students “to take a longer route where they are more exposed to traffic, crime, or environmental hazards.”²⁷ Gates can help mitigate the difficulty of student navigation. Lockable gates can reduce the number of access points to a school while allowing access at certain times. However, school officials should also take into account students’ ability to use gates in the fence line in case of an emergency, as unusable gates may prevent escape from internal threats.²⁸

Apart from compromising safety, **improperly selected fences may exert a negative influence on the atmosphere of a school and community.** In some extreme cases, the creation of a secure school may produce a prison-like appearance. Recent debates over school fencing in several communities have touched on this concern.²⁹ For instance, a

²⁰ “Improving School Access Control.” National Clearinghouse for Educational Facilities, 2008, p. 1.
<http://www.ncef.org/pubs/accesscontrol.pdf>

²¹ “Improving School Access Control,” Op. cit., p. 1.

²² Ibid, p. 2.

²³ Ibid., p. 1.

²⁴ Ibid.

²⁵ [1] Ibid., p. 1.

[2] *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. F-3.

²⁶ “Section 2 – Site Design,” Op cit., p. 1.

²⁷ “Improving School Access Control,” Op cit., p. 1.

²⁸ Ibid.

²⁹ [1] Ellson, M. “Alameda High School fence stirs debate.” *The Alamedan*, Aug. 17, 2012.
<http://thealamedan.org/news/alameda-high-school-fence-stirs-debate>

parent at a Huntsville, Alabama high school complained that a proposed security fence gave the impression that students were “imprisoned.”³⁰ To minimize these concerns, schools should consider aesthetics as well as safety when selecting fencing.³¹

When considering the advantages and disadvantages of fencing, schools will need to take into account their unique needs related to safety and security; an appropriate fencing plan for one school may not be applicable to another. To determine school specific-needs, Minnesota’s Division of Homeland Security and Emergency Management

Minnesota’s Division of Homeland Security and Emergency Management suggests that schools conduct a physical safety assessment, including an evaluation of “playground[s], recreation areas, [and] athletic fields.”

(HSEM) suggests that schools **deploy a team of designated stakeholders to assess campus physical safety and create an emergency plan** through the evaluation that examines “building access and visitor procedures,” “playground, recreation areas, [and] athletic field[s],” and the presence and use of fencing.³² The HSEM division recommends the team include at least a “building administrator, facility engineer and a representative from local law enforcement and fire.”³³ The U.S. Department of Education advises that evaluation should not be a one-time event. Rather, schools should preform regular safety audits of campuses that inspect fencing as well as playgrounds, parking lots, and other outdoor structures.³⁴

[2] Price, D. “School’s fence fires up old rifts in neighborhood.” *Chicago Tribune*, Oct. 16, 2006.

http://articles.chicagotribune.com/2006-10-16/news/0610160115_1_fence-chicago-public-schools-school-folks

[3] Bonvillian, C. “Security fence at Lee High School causes concern at board meeting.” *AL.com*, Apr. 19, 2012.

http://blog.al.com/breaking/2012/04/security_fence_at_lee_high_sch.html

³⁰ Bonvillian, Op. cit.

³¹ Willingham, Op. cit.

³² A full list of safety aspects that school stakeholders should evaluate can be viewed at: *Comprehensive School Safety Guide*. Homeland Security and Emergency Management, 2011, pp. 135-146.

<https://dps.mn.gov/divisions/hsem/mn-school-safety-center/Documents/Comprehensive%20School%20Safety%20Guide.pdf>

³³ *Comprehensive School Safety Guide*, Op cit., pp. 19, 141.

³⁴ *Practical Information on Crisis Planning: A Guide for Schools and Communities*, U.S. Department of Education, Jan. 2007, pp. 2-5. <http://www2.ed.gov/admins/lead/safety/emergencyplan/crisisplanning.pdf>

SECTION II: SELECTING FENCING FOR SCHOOL GROUNDS AND PLAY AREAS

In this section, Hanover presents guidelines for the selection of appropriate fencing for school grounds and recreational areas. The section begins with a review of the relative merits of different fencing materials and then proceeds to discuss guidelines for fencing school grounds and play areas. These discussions aim to provide school districts with a research-based foundation for making decisions about the installation and repair of fencing on their campuses.

THE RELATIVE MERITS OF SELECTED FENCING MATERIALS

OVERVIEW

The characteristics of fences, and in particular the security features of fencing, depend largely on the material from which the fence is constructed. Figure 2.1 summarizes the strengths and weakness of several types of fencing materials that are discussed in further detail below.

Figure 2.1: Overview of Advantages and Disadvantages of Specific Fencing Materials

MATERIAL	ADVANTAGES	DISADVANTAGES
Chain-link	<ul style="list-style-type: none"> ■ Least expensive ■ Easily installed ■ Maintain visibility 	<ul style="list-style-type: none"> ■ Easily breached ■ Targets for vandalism
Welded wire fabric	<ul style="list-style-type: none"> ■ Difficult to cut ■ Does not unravel ■ Less expensive than expanded metal 	<ul style="list-style-type: none"> ■ More expensive than chain-link ■ Less secure than expanded metal
Expanded metal	<ul style="list-style-type: none"> ■ Difficult to cut ■ Does not unravel 	<ul style="list-style-type: none"> ■ More expensive than chain-link and welded wire
Ornamental: wrought iron, steel, or aluminum	<ul style="list-style-type: none"> ■ Not easily breached or vandalized ■ Maintain visibility 	<ul style="list-style-type: none"> ■ Durability and maintenance costs vary greatly
Wood	<ul style="list-style-type: none"> ■ Appropriate for low-security settings 	<ul style="list-style-type: none"> ■ May decrease visibility ■ Inappropriate for higher security settings

It bears mention that the durability of fencing affects both the long-term costs and the effectiveness of school security. The American Society for Industrial Security (ASIS) International, an organization for security professionals, notes that “fences must be maintained if they are to retain their deterrent value.”³⁵ Consequently, school districts should keep the costs of maintenance in mind when selecting a fencing material.

CHAIN-LINK FENCING

Chain-link fences, often the **most economical option**, “are quick to install and provide visibility to both sides of the fence.”³⁶ Coating a chain-link fence can enhance visibility at night and make it more aesthetically pleasing. However, **trespassers can easily breach a chain-link fence**, as it provides footholds that make it easy to climb over, and it is easily cut with wire or bolt cutters³⁷ Effective chain-link fencing avoids “overly large mesh fabric, undersized wire, lightweight posts and rails, and shallow post holes.”³⁸

ASIS International suggests a chain-link fence that is five- to six-feet tall for low security requirements and a seven-foot fence for medium security. Other characteristics that make chain-link fences more secure include a top tension wire instead of a top rail that can serve as a foothold, and a bottom rail that “prevents an intruder from forcing the mesh up to crawl under it.” A concrete burying/mow strip installed in the ground, in which a foot of fencing is affixed, also prohibits intruders from forcing the fence up.³⁹ Figure 2.2 shows a chain-link fence with a top rail and bottom tension wire.⁴⁰

Figure 2.2: Chain-Link Fence with Top Rail and Bottom Tension Wire



Source: Hardy Fence

³⁵ [1] “About ASIS.” ASIS International. <https://www.asisonline.org/About-ASIS/Pages/default.aspx>

[2] *Facilities Physical Security Measures Guideline – Draft*. ASIS International, 2008, p. 16. http://delawareasis.org/uploads/Facilities_Security.pdf

³⁶ [1] “Improving School Access Control,” Op cit., p. 1.

[2] *Facilities Physical Security Measures Guideline – Draft*, Op cit., p. 17.

³⁷ Ibid.

³⁸ *Facilities Physical Security Measures Guideline – Draft*, Op cit., p. 17.

³⁹ Ibid.

⁴⁰ “Chain Link Fencing Information.” Hardy Fence. <http://www.hardyfence.com/chain-link-fences.html>

EXPANDED METAL AND WELDED WIRE FABRIC FENCING

Expanded metal and welded wire fabric fences are pricier than chain-link. However, expanded metal is sturdier than chain-link as it is very difficult to cut and does not unravel. ASIS International notes that expanded metal is “available in uncoated, painted, or galvanized steel, as well as aluminum and stainless steel.”⁴¹ In addition, there are four basic options for expanded metal: standard or regular, grating, flattened, and architectural or decorative. Welded wire fabric is less expensive than expanded metal and is best used for areas that need a lower level of security.⁴² Figure 2.3 shows examples of both expanded metal and welded wire fabric fencing.

Figure 2.3: Expanded Metal (left) and Welded Wire Fabric Fences (right)



Source: Niles Fence & Security Products; Anping Xinhong Wire Mesh Co.⁴³

ORNAMENTAL FENCING

Ornamental fences, such as wrought iron, steel, or aluminum fencing, are a **highly secure option that cannot be easily scaled or vandalized**.⁴⁴ Notably, such fences do not limit surveillance abilities.⁴⁵ The level of security the fence must provide can help determine the “spacing between vertical bars or rods, and the type of fence top (either a top rail covering the tops of the vertical bars or rods, or bars or rods located above the top rail).”⁴⁶ Additionally, according to ASIS International vulnerability assessment models, ornamental fences delay intruders for a minute or more. In the same model, a chain-link fence delays intruders for only four seconds. Ornamental fences, however, may require significant maintenance if made of lower-quality materials.⁴⁷

⁴¹ *Facilities Physical Security Measures Guideline – Draft*, Op cit., p. 18.

⁴² Ibid.

⁴³ [1] “FAQ’s About SECUREX Expanded Metal Fencing.” Niles Fence & Security Products.

<http://www.nilesfence.com/faq.php>

[2] “Wire Mesh Fence Series.” Anping Xinhong Wire Mesh Co. <http://www.chinesefence.com/wire-mesh/welded-mesh-fence.html>

⁴⁴ [1] *Facilities Physical Security Measures Guideline – Draft*, Op cit., p. 18.

[2] “Improving School Access Control,” Op cit., p. 1.

⁴⁵ “Improving School Access Control,” Op cit., p. 1.

⁴⁶ *Facilities Physical Security Measures Guideline – Draft*, Op cit., p. 18.

⁴⁷ Willingham, Op cit.

Figure 2.4 shows two types of ornamental fences. The image on the left depicts a fence with bars above the top rail, while the image on the right depicts a fence with a top rail that covers the vertical bars.

Figure 2.4: Two Types of Ornamental Fences



Source: Ameristar Fence Products⁴⁸

WOODEN FENCING

Wooden fences are best suited for locations with minimal security needs. Ideally, wooden fences should be strong and difficult to climb. ASIS International suggests that the vertical picket sections are not wider than one and three-quarter inches and that the horizontal reinforcement sections are located inside the perimeter of the fence. Notably, a wooden fence may reduce visibility, depending on its design.⁴⁹

As previously noted, the **aesthetics of fencing can be a sticking point between parents and school administrators and planners.** The Arizona SFB notes that “school districts all over the country struggle with maintaining a balance between creating a user-friendly, welcoming school climate and providing a facility that is secure from unwanted intruders.”⁵⁰ School planners should keep aesthetics in mind when considering fencing options. Notably, the DHS suggests that “less attractive fencing can be improved by plantings,” so long as it does not disrupt surveillance.⁵¹

⁴⁸ [1] “Transportation.” Ameristar Fence Products. <http://www.ameristarfence.com/high-security-fence-applications-transportation>

[2] “Montage Plus Ornamental Steel Fence.” Ameristar Fence Products. <http://www.ameristarfence.com/residential-ornamental-wrought-iron-steel-fence-montage-plus>

⁴⁹ *Facilities Physical Security Measures Guideline – Draft*, Op. cit., pp. 18-19. http://delawareasis.org/uploads/Facilities_Security.pdf

⁵⁰ “Arizona Safe Schools, Recommendations of the Arizona School Facilities Board,” Arizona School Facilities Board, p. 1. <http://www.azsfb.gov/sfb/21st%20Century%20Schools/School%20Safety%20Recommendations.pdf>

⁵¹ [1] *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op. cit., p. 2-37.
[2] “Improving School Access Control,” Op. cit., p. 1.

SELECTING PERIMETER FENCING

Traditionally, the fencing at a school's property line provides the school's first line of defense against violence or intrusion.⁵² A perimeter fence also establishes ownership of the property.⁵³ Based on comments from its board and the public, a review of scholarly literature, and the CPTED methodology, the Arizona School Facilities Board (SFB) recommends a perimeter fence as one of its 10 physical measures to increase school safety. However, the Arizona SFB notes that perimeter fencing serves more "to keep outsiders out than to keep insiders in."⁵⁴

When constructed with the needs of an individual school in mind, and with the appropriate materials, **perimeter fencing can create a safer school environment by augmenting the CPTED strategies of natural surveillance and access control.** Accordingly, schools should reflect on the contribution of perimeter fencing to these strategies when choosing among various options.

SCHOOL SURVEILLANCE

As noted in various documents, perimeter fencing should not be made of a material that hinders surveillance conducted by school staff.⁵⁵ Schools should place entrances and exits so that they can be easily surveyed by school staff. Minnesota's Division of Homeland Security and Emergency Management suggests that schools consider surveillance elements when determining school safety and emergency preparedness plans. Surveillance elements schools should ensure when planning entrances in perimeter fencing include:

- Designated points of entry are monitored to control building access.
- School staff monitors all entrances and exits during arrival and departure of students.
- Main entrance is observable from main office.⁵⁶

Fences may also add a layer of surveillance by incorporating, "various types of sensing devices that relay warning of an intruder to security personnel."⁵⁷ Examples include video cameras that provide a feed which staff can monitor and motion detectors that activate lighting as a deterrent to intruders.⁵⁸

⁵² *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. 2-23.

⁵³ *Ibid.*, p. F-3.

⁵⁴ "Arizona Safe Schools, Recommendations of the Arizona School Facilities Board," Op. cit., p. 4.

⁵⁵ [1] "Improving School Access Control," Op cit., p. 1.

[2] "Section 2 – Site Design," Op cit., pp. 1, 10-11.

⁵⁶ Bulleted points quoted verbatim from: *Comprehensive School Safety Guide*, Op cit., p. 137.

⁵⁷ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. 2-37.

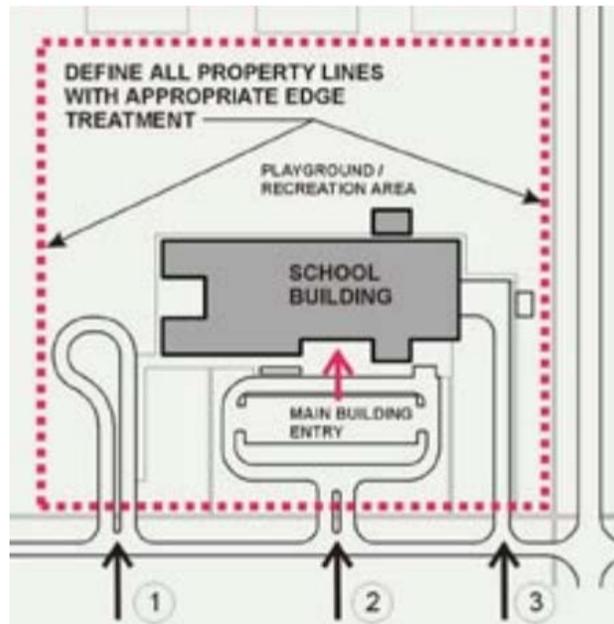
⁵⁸ [1] *Ibid.*, p. 5-10.

[2] "Improving School Access Control," Op cit., p. 3.

ACCESS POINTS

According to research compiled by the NCEF, schools should **keep entry points in perimeter fencing to a minimum, but include at least two entry points** in the event one is blocked.⁵⁹ As noted in the previous subsection, access points can enhance the ease of natural surveillance by school staff by limiting entrances and exits that must be watched. It is especially useful if main entrances and exit points are in areas that can be **easily viewed from administrative buildings**.⁶⁰ Figure 2.5 provides an example of a school with perimeter fencing that incorporates limited access points, emulating the NCEF's suggestion.

Figure 2.5: Fenced Perimeter with Limited Entry Points



Source: Florida Department of Education⁶¹

Note: Labeled locations are 1) bus access; 2) parent drop-off point; and 3) service entrance

An unbroken perimeter fence line may inadvertently put students at risk by limiting access too strictly. If fencing blocks student pathways, students may be forced to follow longer, less safe routes. To minimize these problems, schools can install lockable gates, which reduce the number of access points while allowing access at certain times.⁶²

RANGE AND HEIGHT OF PERIMETER FENCING

When taking into account the possibility of violence, the DHS recommends that schools be aware that a **wider barrier** created by fencing around the school **provides greater protection** against the potential effects of weapons.⁶³ However, including parking lot areas

⁵⁹ "Improving School Access Control," Op cit., p. 1.

⁶⁰ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. 3-42.

⁶¹ "Section 2 – Site Design," Op cit., p. 1.

⁶² "Improving School Access Control," Op cit., p. 1.

⁶³ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. 2-20.

within the fenced perimeter of the school can work against other traditional security measures.⁶⁴ Students' safety may be compromised if they can freely enter an area with cars.⁶⁵ The DHS also provides the extreme example of a school being vulnerable to a vehicle bomb.⁶⁶ To **prevent vehicles from accessing areas too close to school buildings**, schools can use fixed bollards instead of a fence. A fixed bollard is a short "cylinder usually made of steel and filled with concrete placed on end in a deep concrete footing in the ground" which can block vehicle entry to school buildings while allowing pedestrians to enter.⁶⁷

While documents rarely make recommendations for the exact height of fencing, they do note that this factor can determine access onto school property.⁶⁸ However, **the height of perimeter fencing depends on schools' individual needs**. Although the Arizona SFB suggested an increase from six-foot fencing to eight-foot fencing for perimeters of kindergarten-sixth grade campuses, it recognized that warrant for the increased height would be on a site-specific basis.⁶⁹

SELECTING PLAYGROUND FENCING

Fencing around playgrounds and recreational areas should promote easy surveillance and safety. Depending on where these areas are located, certain fencing materials may be better suited. For playgrounds, the Public Schools of North Carolina recommend non-toxic fencing.⁷⁰ Playgrounds inside school fences do not need to defend against the same security issues. For this reason, fences can be shorter, while made of a material that enables surveillance. **Fencing for recreation areas that are on the perimeter of school grounds must take into account similar security issues as perimeter fencing**, including deterring intruders and enabling natural surveillance.

The Public Schools of North Carolina recommend that kindergarten and first grade classes have separate playgrounds that are "fenced in for safety and supervision," while pre-kindergarten playgrounds must be fenced in.⁷¹ This prevents children "from inadvertently running into a street or leaving the playground unsupervised."⁷² Playground fencing also keeps younger children out of harm's way by acting as a barrier for play equipment, minimizing the likelihood that children may run after a ball and out of the safety of the playground.⁷³ For these reasons, as well as the fact that fencing keeps "stray animals and

⁶⁴ Ibid, p. 2-41.

⁶⁵ *The School Site Planner*. Public Schools of North Carolina, Feb. 2010, p. 39.
<http://www.schoolclearinghouse.org/pubs/SchoolSitePlanner.pdf>

⁶⁶ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. 2-19.

⁶⁷ Examples of fixed bollards can be viewed on: Department of Homeland Security, Op cit., p. 2-33.

⁶⁸ *Primer to Design Safe School Projects in Case of Terrorist Attacks and School Shootings*, Op cit., p. F-4.

⁶⁹ "Arizona Safe Schools, Recommendations of the Arizona School Facilities Board," Op cit., p. 4.

⁷⁰ *The School Site Planner*, Op cit., p. 39.

⁷¹ Ibid, pp. 36, 39.

⁷² Ibid, p. 39.

⁷³ Christoph, N. J. "Playgrounds with Maximum Safety and Minimal Risk." *School Planning & Management*, 38:2, 1999, p. 44.

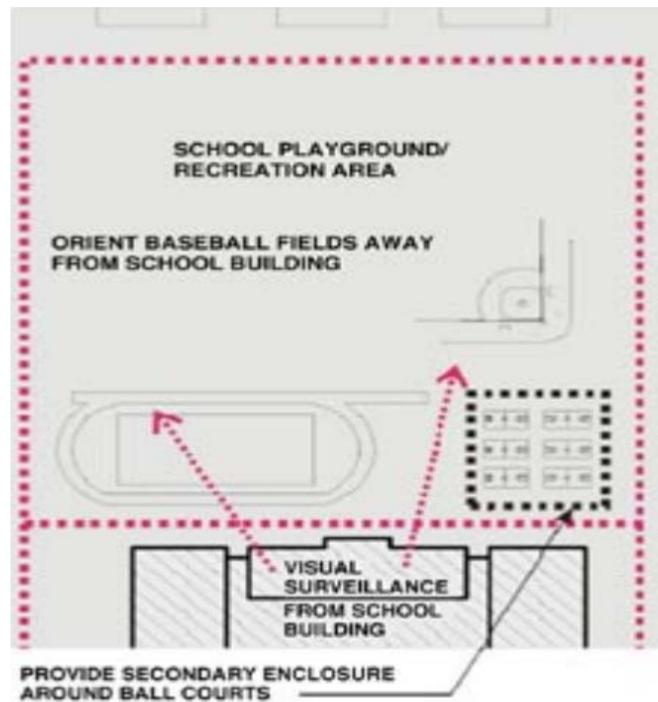
strangers off the playground,” Washington State Educational Service District (ESD) 112 recommends that school playgrounds have a barrier or fence.⁷⁴

Washington State ESD 112 notes that **fencing or other barriers can create territoriality that helps to separate activity areas.**⁷⁵ This can apply to playgrounds appropriate to different age groups, or defining differences between playgrounds and sport fields. Placing fences around playground areas gives “students a sense of security, especially in elementary schools.”⁷⁶ The Public Schools of North Carolina suggest that play areas for younger children are close to their classrooms and away from older children’s playgrounds.⁷⁷

When planning play areas, school administrators should ensure that the areas can be **easily accessed by emergency vehicles.**⁷⁸ In addition, maintenance trucks must be able to enter fenced play areas and athletics fields that will need maintenance.⁷⁹

Figure 2.6 shows a school with a perimeter fence, as well as a fence that separates the school building from the recreation area.⁸⁰ An additional fence around ball courts creates territoriality over a separate activity area. As noted in the Figure, the play area can be surveyed from the school building. The demonstrated use of fencing between recreation areas and school grounds also creates limited access points for students to enter the recreation area. It also separates school buildings from community members who may use the recreational facilities after school hours, a circumstance further discussed in the next subsection.

Figure 2.6: Fencing Around School Perimeter and Recreational Area



Source: Florida Department of Education

⁷⁴ *School Playground Safety Guidelines*. Educational Service District 112, p. 29.
<http://web3.esd112.org/docs/insurance-programs/playgrdgdln1200.pdf>

⁷⁵ *Ibid.*

⁷⁶ *The School Site Planner*, Op cit., p. 16.

⁷⁷ *Ibid.*, p. 39.

⁷⁸ *Comprehensive School Safety Guide*, Op cit., p. 141.

⁷⁹ *The School Site Planner*, Op cit., p. 37.

⁸⁰ “Section 2 – Site Design,” Op cit., p., 10.

In addition to defining territoriality, **high fencing around hard ball courts protects windows of buildings near the courts.**⁸¹ School administrators should keep in mind that fencing around all recreational areas should minimize climbing opportunities, while using a material that allows for easy supervision.⁸²

Figure 2.7 shows one school's choice of chain-link fence. The fence is tall, which can deter climbing as well as protect windows in surrounding buildings, and does not reduce visibility. As the figure notes, the gates in the fence around the hard ball courts create an additional method to control access.

Figure 2.7: Example of Hard Ball Court Fencing



Source: Florida Department of Education⁸³

RECREATIONAL JOINT-USE FACILITIES

Recreational areas are susceptible to safety and security issues. With such areas, the Florida DOE suggests multiple enclosures around recreational areas to enable greater access control. **Enhanced control is especially important for those recreational areas that the school shares with the public.**⁸⁴

Playgrounds and school facilities available for use after-hours should be delineated by internal boundaries which establish “a distinct perimeter for both the school and the joint-use facilities with separate and secure access points.”⁸⁵ Views to these areas should be unobstructed by buildings and have fencing that is easy to see through. Community

⁸¹ Ibid.

⁸² Ibid, pp. 10-11.

⁸³ Ibid, p. 10.

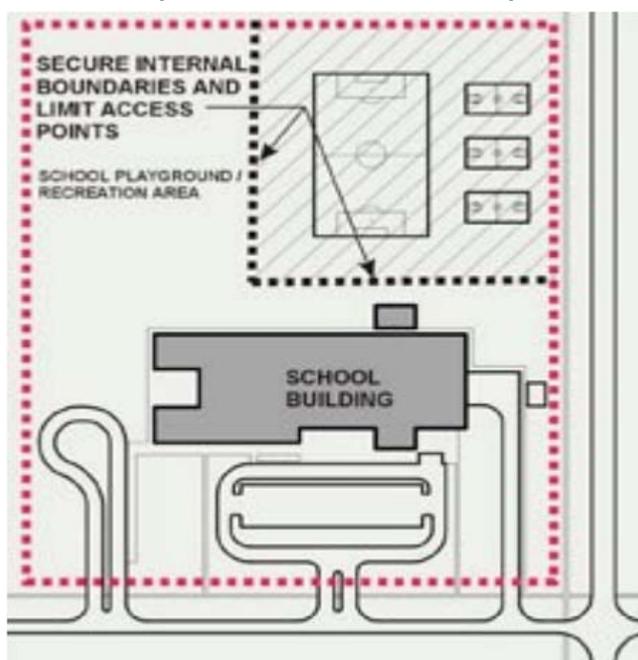
⁸⁴ Ibid.

⁸⁵ Ibid, p. 2.

members and police should be able to observe after-hour use of recreational areas through the perimeter fence line, so vegetation and fencing should be chosen accordingly.⁸⁶

Figure 2.8, below, is an example of fencing which separates joint-use areas from school grounds. Figure 2.6 offers another illustration of how joint-use recreational areas can be separated from school grounds to provide community members with access on the recreation area side.

**Figure 2.8: Recreational Facilities Jointly Used
by the School and Community**



Source: Florida Department of Education⁸⁷

⁸⁶ Ibid, pp. 10-11.

⁸⁷ Ibid, p. 1.

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