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"Creating a Citadel of Learning"

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Introduction

Secretary DeVos, Secretary Azar, Secretary Nielsen, Attorney General Sessions, and Deputy Secretary Zais, thank you for the invitation to appear before you today. On behalf of the American Institute of Architects (AIA), it is an honor to partner with you and your staff to promote design solutions for the challenges and opportunities facing today's schools. For over 20 years, the AIA, through its Committee on Architecture for Education, has been working to develop and disseminate best practices in education architecture – ones that create positive learning environments while better safeguarding students and school faculty.

While I have designed many schools during my 40 plus years practicing architecture, perhaps none has been more impactful and fulfilling than the new Sandy Hook Elementary School. And while it is only I who appear before you today, the success of the new Sandy Hook school was possible only with the full participation and collaboration of several hundred partners including my fellow architects, our consulting engineers, the construction management team, the construction workers and most importantly the people of Newtown.

Not surprisingly, there was a significant focus to design this new school in a way that would prevent a tragedy of this caliber from happening again. To be clear though, no school

design can stop all school violence, especially ones involving guns. There is no single "design solution" or design standard to prevent them. However, there are *design principles and best practices* that can help to mitigate risk, both before and during an act of mass violence such as a shooting.

In general, each school, whether a new build or a retrofit, must be designed for its unique student population, for its unique location, and to meet the needs of its unique community. More specifically, and of paramount importance, the primary goal of each school is to provide an inspiring, healthy environment that promotes learning. As we address this particular threat to children and adults in our schools, we must remember that schools are buildings that must be designed as schools first and foremost. Their security features, while vital and necessary, should be as passive as possible. They should be incorporated into the school's design, rather than define the school. Failing to do so puts children's education, emotional development and pro-social behavior at risk. To that point, I'd like to provide some specific design principles and strategies that architects can routinely use.

Design Principles

There has been much discussion about "hardening" schools. This may be the most common reaction to recent tragic events, and while hardening elements have their place within a strategic plan of security measures, hardening alone can be costly, ineffective, and counter-productive to a positive learning environment. Furthermore, physical design features, such as hardening, are only one leg of an effective School Security Plan. Hardening must be coordinated with Technology components, such as security cameras, and the third critical aspect, Operations,

which are the safety protocols and procedures that need to be well-designed, rehearsed, and enforced.

With this 3-leg approach, the architects' key security design focus is "layering" the physical environment with bringing in those particular security elements that are most suitable to each unique design.   This layered concept arose from Crime Prevention Through Environmental Design or CPTED. The goal of CPTED design principles is to Deter, Detect, and Delay the assailant, and lastly to Defend the occupants. With layering, if one design element or layer is breached, another layer will be encountered to continue to slow or limit the assailant's progress. "Layering" reinforces each selected security design solution to build in more minutes for first responders. School site and building designs can actually slow down an assailant, giving students and school personnel more time to react and position themselves securely while allowing law enforcement more time to arrive on the scene and intervene. This is critically important in all school settings, but especially in rural and more remote areas where the average law enforcement response time is longer because their jurisdictions cover more geography.

Architects utilize five primary strategies of CPTED: Territory Reinforcement, Natural Surveillance, Access Control, Image, and Access Hardening.

Sandy Hook

When redesigning Sandy Hook Elementary School, we applied these design principles based on input and feedback from the community. As architects, it is our responsibility to bring together the community's perspectives, especially when designing a school. Convening stakeholders and gathering their feedback is central to how architects craft a design solution –

one that is both functionally responsive and contextually sensitive to a variety of community stakeholders' interests.

In the case of Sandy Hook and given the nature of the attack, many parents initially envisioned impenetrable fencing and high windows. However, these reactions had to be balanced against the negative effect such overt security tactics would have on both students and staff. Instead of costly perimeter fencing, CPTED principles rely on defining the site through a combination of minimal fencing, landscaping materials, and natural geography, which achieves the goal of signaling where you are being observed and monitored. There are no blind approaches to the school.

Incoming traffic is diverted into staff or visitor parking lots, while school busses and deliveries are the only vehicles allowed to enter the bus loop that comes closest to the school. All of this activity is readily visible from the school. This *natural surveillance* is maximized through careful design of vegetation and the placement of the main office to provide an unobstructed view of the approach to the school. Natural surveillance is paired with surveillance by technology, in the form of well-placed video cameras, to offer early detection.

Architects are especially concerned with maximizing transparency to the greatest extent practicable within the school. Not only does it allow for more passive natural surveillance and supervision of the surrounding exterior space of the school by staff and faculty, it also allows more daylight to illuminate classrooms while using less electrical energy, and as research shows, daylight is one of the most powerful antidepressants and positive boosts to one's mood and ability to concentrate and learn. This transparency can also establish a greater sense of school community among the students and faculty.

As noted earlier, a reaction to limit windows or a desire for only high windows also removes the ability for inhabitants to view the outdoors and eliminating natural surveillance, but also eliminating the proven benefits of a connection to nature. Based on research, high windows would be perceived as a fortress, and young elementary school students would have been too short to see out the windows. Instead our approach was to slope the grade away from the building, such that the windows are higher to a potential assailant but feel normal to the children inside.

Another example from Sandy Hook incorporated a variety of requirements in a single design element. Our security consultant had advised that an important layer would be a stand-off area from the front of the school, where both vehicles and people would not be allowed. At the same time, our sustainability consultant was advising on environmentally-friendly methods of diverting rain water from the school roof. And for the front façade design, we were looking to create a beautiful approach as well as something symbolic of the community identity. Our solution to all three concerns was a rain garden. With hardy colorful plants and a sunken rock "river," it is a decorative natural element that runs along the entire front of the school – creating a moat of sorts, that is clearly not friendly to cars or people. The rain water is channeled into the garden where it percolates into the soil and is naturally cleansed by the plants. The design then has three small footbridges to cross the rain garden to enter the school – a reflection of the community identity and the many streams and rivers of the area that are crossed everyday with bridges throughout town.

The children are unaware about the security benefits provided by the rain garden - and they don't need to know. For them, the rain garden is a teaching tool where they can see and learn about the cycle of water and the seasonal plants with which we share our land. This small

but impactful example shows the value of taking a comprehensive, design-centered approach to school security: it is a highly specific answer to multiple physical and emotional considerations at once.

Conclusion

The desire to craft design solutions for the challenges facing schools is absolutely a priority for communities. As architects, we see this every day. However, two ongoing problems prevent local school officials from implementing these solutions: lack of access to quality information regarding design solutions and the ability to fund them. Consider that a survey was conducted one year after the Sandy Hook shooting. It polled architecture and design firms across the country with the simple question: has there been an increase in requests from education officials for security features in schools. Most of the responses were "no" or "about the same".

Part of the reason for this was lack of funding. However, the other part was due to a lack of quality information. The truth is local education officials don't have reliable information. Most don't know where to begin or what information to trust in their efforts to make their schools safe and secure. These two issues could be solved by allowing certain federal grants to fund design services and furthermore, establishing a federally housed school design clearinghouse that serves as an independent, unbiased and "one stop shop" informational repository for state and local education officials.

In conclusion, while there are limitations on design to prevent these tragedies, design can significantly mitigate them. Therefore, the AIA would like to continue working with you and your Congressional colleagues on potential solutions that can truly help protect our children.

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Thank you again for the opportunity to speak. I look forward to your questions, and, on behalf of the AIA, continuing to be a resource on this important issue.