Risk Management Series

Primer

to Design Safe School Projects in Case of Terrorist Attacks

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RISK MANAGEMENT SERIES

Primer *to* Design Safe School Projects in Case of Terrorist Attacks

PROVIDING PROTECTION TO PEOPLE AND BUILDINGS

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The creation of the Department of Homeland Security (DHS) is one of the most significant transformations in the Federal Government in decades, establishing a department whose first priority is to protect the nation against terrorist attack. Within the DHS, the Directorate of Emergency Preparedness and Response (EP&R) is focused on ensuring that our nation is prepared for catastrophes, including both natural disasters and terrorist assaults.

This Primer for Protection of Schools Against Terrorist Attacks provides guidance to protect students, faculty, staff, and their school buildings from terrorist attacks. It also provides guidance to the building science community of architects and engineers working for local institutions on school projects.

This document is intended for use by schools who feel that they are at risk to terrorist attacks. It provides necessary guidance to those who desire to increase the performance of their school and related infrastructure. Not all schools are at risk of terrorist attacks. The decision-makers in each school district should use current and available threat information from the proper sources to make this determination. The use of experts to apply the methodologies contained in this document is encouraged.

This primer references several sources for additional information, including publications completed by other government agencies. The reader is encouraged to obtain additional guidance.

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- General Services Administration
- Naval Facilities Engineering Service Center
- Naval Facilities Command (NAVFAC) Criteria Office

- USACE Protective Design Center
- Department of Veterans Affairs
- Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health
- Department of Justice, Office of Domestic Preparedness (DHS - Border and Transportation Security)
- United States Air Force - Civil Engineer Support Agency

BACKGROUND

The purpose of this primer is to provide the design community and school administrators with the basic principles and techniques to make a school that is safe from terrorist attacks and at the same time is functional, aesthetically pleasing, and meets the needs of the students, staff, administration, and general public. Protecting a school building and grounds from physical attack is a significant challenge because the ability to design, construct, renovate, operate, and maintain the facility is spread across numerous building users, infrastructure systems, and many building design codes.

An American high school

There is a strong interest in the United States (U.S.) in ensuring the safety of students, faculty, and staff in our schools. Schools are integral parts of their communities. On any given weekday, nearly 53 million young people aged 5 to 17 attend more than 117,000 public and private schools where 6 million adults work as teachers or staff (counting students, faculty, and staff, this constitutes more than one-fifth of the U.S. population). Additionally, schools are resources for their communities. Many schools are used as shelters, command centers, or meeting places in times of crisis. Schools are also used widely for polling and voting functions. In some communities, schools are places of health care delivery.

Schools may or may not be the targets of terrorism, but they are certain to be affected by terrorism, whether directly or indirectly.

On September 11, 2001, four elementary schools and three high schools located within 6 blocks of the World Trade Center were just beginning classes when the first plane hit the north tower. Thousands of children were exposed to the dust clouds from the collapsing buildings. Even those children not in the immediate vicinity experienced a great deal of anxiety. Children in at least three states (New York, New Jersey, and Connecticut) had parents working in or around the World Trade Center that day. In the Washington, DC, area, schools faced similar situations after the Pentagon was attacked.[1]

Many Americans feel that schools should be the safest place our children can be, perhaps at times even safer than the homes in which they live. Security is not a standalone capability; it is a critical design consideration that should be constantly reviewed and scrutinized from the design phase through construction or rehabilitation and onto building use.

The focus of this primer will be on the threats posed by potential physical attacks on a school by terrorists. Attacking schools and school children could be a highly emotional and high profile event. At the time of publication of this primer, there have been no direct terrorist threats against a school known to the public; however, schools could be indirectly threatened by collateral damage from a terrorist attack directed at nearby facilities. Protecting a school against terrorist attack is a challenging task. A school may have considerable vulnerabilities, because of its well defined periods of use, designated access points, storage of sensitive personal information, minimal security forces, and numerous avenues of penetration and escape for attackers.

This primer should be used in conjunction with the Federal Emergency Management Agency (FEMA) 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings,* and FEMA 427, *Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks.*

[1] National Advisory Committee on Children and Terrorism (NACCT)

SCOPE

This primer presents an approach to protecting schools at risk from terrorist attacks. The information presented is intended primarily for architects and engineers, or school administrators with a technical background. This publication is designed to meet the needs of all schools, including those with serious security concerns. Because security concerns of individual schools vary greatly, some users with modest security concerns may feel beleaguered by the amount of information and technical approach presented. They should feel free to select the methods and measures that best meet their individual situations while gaining a general appreciation of security concerns and risk management.

Several design philosophies and techniques have been incorporated into this primer, including the Department of Defense (DoD) Minimum Antiterrorism Standards, the Army and Air Force Security Engineering Manual, the General Services Administration (GSA) Public Building Standards, the Department of Veterans Affairs (VA) Building Vulnerability Assessment Checklist, and the Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH) Guidelines for Airborne Contaminants.

ORGANIZATION AND CONTENT OF THE PRIMER

This publication contains many how-to aspects based upon current information contained in FEMA, Department of Commerce (DOC), DoD (including Army, Navy, and Air Force), Department of Justice (DOJ), GSA, VA, CDC/NIOSH, and other publications. It is intended to provide an understanding of the current methodologies for assessing threat/hazard, vulnerability, and risk, and the design considerations needed to improve protection of new and existing buildings and the people occupying them. As needed, this primer should be supplemented with more extensive technical resources, as well as the use of experts when necessary.

- Chapter 1 presents a methodology for architects, engineers, and school administrators to analyze the safety of students, teachers, and staff for vulnerabilities to various terrorist threats. The methodology presented will assist schools in performing risk management by helping them to identify the best and most cost-effective terrorism mitigation measures for their unique security needs.
- Chapters 2 and 3 discuss site and layout, and building design guidance and safety plans, respectively, and mitigation measures or comprehensive architectural and engineering design considerations to provide an acceptable level of protection. Specifically, Chapter 2 discusses comprehensive architectural and engineering design considerations for the school site, from the property line to the school building. Chapter 3 presents design considerations for the building envelope.
- Chapter 4 is a brief discussion of explosive blast theory. Chapter 5 presents chemical, biological, and radiological (CBR) measures that can be taken to mitigate school vulnerabilities and reduce associated risk for these terrorist tactics or technological hazards.
- Chapter 6 is a standalone description of the concept of safe rooms within schools that will resist CBR and blast threats intended to provide school board members and decision-makers with the basic components of a protective system.
- Appendices A, B, and C contain acronyms, general definitions, and chemical and biological agent characteristics, respectively. Appendix B is an extensive glossary with terminology used in the report.
- Appendices D and E present a comprehensive bibliography of publications (including information for obtaining the publications), and the associations and organizations capturing the building security guidance needed by the building sciences community (including web sites), respectively.
- Appendix F contains the Building Vulnerability Assessment Checklist.

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TABLE OF CONTENTS

TABLES

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

Chapter 6

FIGURES

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5