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Emergency Management and Protective Actions

Preparing Makes Sense. Get Ready Now. <http://www.ready.gov>

General guidance from DHS on steps to take to prepare for and respond to intentional or accidental releases of chemical, biological and radiological agents and a nuclear blast. Covers schools and daycare, neighborhoods and apartment buildings, and the workplace.

Bioterrorism Preparedness and the Citizen. Centers for Disease Control and Prevention. <http://www.pamf.org/bioterror/links.html> (chemical and radiological preparedness guidance)

Current guidance on proper actions to take for chemical and radiological events.

Facts About Shelter in Place – Chemical Emergencies. Centers for Disease Control. <http://www.bt.cdc.gov/planning/shelteringfacts.pdf>

More detailed guidance on protective actions in event of chemical release.

Websites on Sheltering in Place. <http://www.scchealth.org/docs/doche/bt/interim.html>

Warning, Evacuation and In-Place Protection Handbook, Emergency Management Division, Michigan Division of Emergency Management, 1994. <http://floridadisaster.org/bpr/>

Warning systems, protective action decision-making, case studies involving chlorine, bromide, and sulfuric acid. Good source for protective actions and shelter considerations in a chemical incident.

Will Duct Tape and Plastic Really Work? Issues Related to Expedient Shelter-In-Place. John Sorensen and Barbara Vogt. August 2001. CSEPP, FEMA.

Defines and discusses expedient sheltering and the effectiveness of select materials, including duct tape.

Shelters by Building Occupancy

Sheltering in the Workplace

Sheltering in Place at Your Office – A general guide for preparing a shelter in place plan in the workplace. National Institute for Chemical Studies. <http://www.nicsinfo.org>

Provides a sample shelter plan that lists procedures, responsible parties, and needed supplies, equipment and rules.

Fact Sheet on Shelter-in-Place, American Red Cross.

Provides the basics on shelter-in-place at home and the workplace. February 2003

Fire and Explosion Planning Matrix (OSHA, 2004). <http://www.osha.gov/dep/fire-expmatrix/index.html>

Addresses workplace vulnerability to acts of terrorism and identifies series of terrorism risk factors (see below) that may elevate the risk of that facility to terrorism acts. These factors may be considered in this project as criteria for higher level of in-place shelter.

In its [Worksite Risk Assessment List](http://www.llr.state.sc.us/workplace/sectone.pdf) [<http://www.llr.state.sc.us/workplace/sectone.pdf> – 507kb PDF], an employer will be asked whether the worksite is characterized by any of the following terrorism risk factors:

- uses, handles, stores or transports hazardous materials;
- provides essential services (e.g., sewer treatment, electricity, fuels, telephone, etc.);
- has a high volume of pedestrian traffic;
- has limited means of egress, such as a high-rise complex or underground operations;
- has a high volume of incoming materials (e.g., mail, imports/exports, raw materials);
- is considered a high profile site, such as a water dam, military installation, or classified site; or
- is part of the transportation system, such as shipyard, bus line, trucking, airline.

Sheltering in Schools

Fairfax County, VA school preparedness and emergency management – good overall document for school preparedness and shelter in place. <http://www.fcps.edu/emergencyplan/faq.htm>

Comprehensive guidance on protective actions for public schools.

Schools and Terrorism: A Supplement to the National Advisory Committee on Children and Terrorism, Recommendations to the Secretary (August 12, 2003)

Examines the broader issues of integrating school vulnerability and safety issues into community preparedness.

Primer to Design Safe School Projects in Case of Terrorist Attacks. 2003.
FEMA. December.

Provides comprehensive guidance to protect students, faculty, staff and their school buildings from terrorist attacks.

Creating a Safe Haven, Dennis Young, http://asumag.com/ar/university_creating_safe_haven/

Guidance on incorporating safe haven principles into school design and construction.

Sheltering in Place – Princeton University

Guidance on protective actions for a campus setting.

Shelters by Hazard - Natural

Hurricanes

Hurricane Shelters, American Red Cross. Provides basic criteria for shelter designation for hurricane shelters. <http://www.ih2000.net/jasperem/Hurricane%20-%20Shelters.pdf>

Shelter Implementation Workshop. Florida Division of Emergency Management, June 2000.

Proceedings on workshop that addresses problems, issues, and solutions for implementing statewide plan for hurricane shelters.

Standards for Hurricane Evacuation Shelter Selection. American Red Cross (ARC 4496). January 2002

ARC 4496 is the national standard for hurricane evacuation shelter selection criteria. Provides detailed guidance and standards for hurricane shelter selection.

State of Florida Shelter Plan, Florida Division of Emergency Management, 2004. <http://floridadisaster.org/bpr/Response/engineers/documents/2004SESP/Individual%20Elements/2004-SESP-AppxB.pdf>

Public shelter design criteria, based on ARC 4496 and Florida design criteria. State requirements for education facilities.

<http://floridadisaster.org/bpr/Response/engineers/2004seep.htm>. The website of the Critical Infrastructure and Engineering Unit of the Florida Division of Emergency Management. Contains links to shelter surveys and plans.

Tornadoes and High Winds

Taking Shelter From the Storm: Building a Safe Room Inside Your House. FEMA 320. <http://www.fema.gov/pdf/fima/fema320.pdf>.

FEMA 320 provides guidance on shelter design and construction of the following types of shelters:

- shelter underneath a house
- shelter in the basement of a new house
- shelter in the interior of a new house
- modification of an existing house to add a shelter in one of these areas

FEMA Community Wind Shelters: Background and Research. 2002.

Extreme Event Protection (Hurricanes and Tornadoes). <http://www.builtSAFE.com/steelclad.pdf>

Example of one Texas-based product on the market for extreme wind event protection.

Earthquakes

Federal Emergency Management Agency. 1988. *Handbook for the Seismic Evaluation of Buildings*. FEMA 310. January.

Federal Emergency Management Agency. 1990. *Seismic Considerations for Elementary and Secondary Schools*. FEMA 149.

Federal Emergency Management Agency. 2003. *Existing School Buildings: Incremental Seismic Retrofit Opportunities*. FEMA 318. December.

Shelters by Hazard – Manmade Hazards/Threats

Harden Structures and Systems – Apocalypse House (2003).

Focuses on shelter design for climatic, nuclear, biological, chemical and conventional weapons threats, and the guidelines established by the Federal Emergency Management Agency (FEMA), the U. S. Department of Energy Oak Ridge National Laboratory, as well as more rigorous standards set by the Technical Directives for Shelters by the Swiss Federal Department of Civil Defense.

Building and Shelter Design: Security and Protection Issues

Building Security Through Design: A Primer for Architects, Design Professionals and Their Clients. AIA.

Protecting Occupants of High-Rise Buildings. Rae Archibald (Deputy Fire Commissioner for NYC), <http://www.rand.org/publications/randreview/issues/rr.08.02/occupants.html>

Recommended actions for building owners of high-rise buildings.

Guidance Publication for Emergency Operations Centers: Project Development and Capabilities Assessment, Florida Division of Emergency

Management (2003) <http://floridadisaster.org/bpr/Response/engineers/eoc/eocguide.pdf>

Provides guidance on a broad range of vulnerability assessment and vulnerability reduction measures for the FDEM EOC. Many of the recommendations for EOC survivability, sustainability, and interoperability can be applied to multi-hazard shelters.

Security Engineering (Army TM 5-853/Air Force Manual 32-1071)

Design and Analysis of Hardened Structures to Conventional Weapons Effects (TM 5-855-1)

The Homeland Defense Office of the U.S. Army Soldier and Biological Chemical Command (publications, products, and services):

ANSI/ASME N510, *Testing of Nuclear Air Treatment Systems*, 1989.

ASHRAE, *Handbook of Fundamentals*, 1997.

ASHRAE 52.1, *Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter*, 1992.

ASHRAE, *Handbook Applications Environmental Control for Survival*, 1982.

ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, 1989.

ASHRAE Ventilation Standard 62-1981,1

ASME AG-1, Section FC, *Code on Nuclear Air and Gas Treatment*, 1996.

ASME N509, *Nuclear Power Plant Air-Cleaning Units and Components*, 1989.

ASME NQA-1, *Quality Assurance Requirements for Nuclear Facility Applications*, 1994.

ASTM E779-03, *Standard Test Method for Determining Air Leakage Rate by Fan Pressurization*, 1987.

EA-C-1704, *Carbon-Activated, Impregnated, Copper-Silver-Zinc-Molybdenum-Triethylenediamine (ASZM-TEDA)*, U.S. Army Edgewood Research, Development and Engineering Center (ERDEC), Aberdeen Proving Grounds, MD. January 1992.

ERDEC-TR-336, *Expedient Sheltering In Place: An Evaluation for the Chemical Stockpile Emergency Preparedness Program*, U.S. Army Edgewood Research, Development and Engineering Center (ERDEC), Aberdeen Proving Grounds, MD. June 1996.

FM 3-4, *NBC Protection*, 29 May 1992.

IEEE Std-344, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*, 1987.

MIL-PRF-32016(EA), *Performance Specification Cell, Gas Phase, Adsorber*, 26 November 1997.

MIL-STD-282, *Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance-Test Method*, 28 May 1956.

MS MIL-F-51079D, *Filter Medium, Fire-Resistant, High-Efficiency*, 17 February 1988.

NFPA 101, *Life Safety Code*, 1997.

TM 5-810-1, *Mechanical Design Heating, Ventilating, and Air Conditioning*, 15 June 1991.

TM 5-855-1, *Design and Analysis of Hardened Structures to Conventional Weapons Effects*, August 1998.

UL 586, *High-Efficiency, Particulate, Air Filter Units*, 1996.

ER 1110-345-100, *Design Policy for Military Construction*.