ELEMENT 2 RESOURCES

LAND USE, BUILDING DESIGN AND REGULATORY CONTEXT

STEP 1: Land Use, Siting and Landscape

The Sustainable Sites Initiative: Guidelines and Performance Benchmarks

American Society of Landscape Architects, Lady Bird Johnson Wildflower Center at the University of Texas at Austin, United States Botanic Garden (2009)

The Sustainable Sites Initiative is dedicated to fostering a transformation in land development and management practices that will bring the essential importance of ecosystem services to the forefront. For purposes of the Initiative, land practices are defined as sustainable if they enable natural and built systems to work together to "meet the needs of the present without compromising the ability of future generations to meet their own needs."

STEP 2: Transportation and Access

Climate Impacts on Transportation

U.S. Environmental Protection Agency

This web-based resource includes both climate impacts on transportation as well as case studies of transportation adaptation. In the United States, transportation systems are designed to withstand local weather and climate. Transportation engineers typically refer to historical records of climate, especially extreme weather events, when designing transportation systems. However, due to climate change, historical climate is no longer a reliable predictor of future impacts.

Climate Adaptation and Transportation: Identifying Information and Assistance Needs

Center for Clean Air Policy, Environmental and Energy Study Institute (May 2012)

This report identifies the critical support needs of surface transportation professionals as they adapt their practices to climate change and shifting trends in extreme weather. It focuses on assessing the operational needs of transportation practitioners for evaluating and implementing adaptation measures.

U.S. Department of Transportation Climate Adaptation Plan: Ensuring Transportation Infrastructure and System Resilience

U.S. Department of Transportation (DOT) (2012)

Transportation both contributes to and will be impacted by climate change. This plan addresses adaptation work only. This plan reflects FY12 and FY13 commitments as well as other DOT accomplishments. It incorporates DOT's earlier report on vulnerabilities to climate variability and change.

American Society of Civil Engineers ASCE 24-05: Flood Resistant Design and Construction

American Society of Civil Engineers (ASCE)

ASCE 24 is a referenced standard in the International Building Code® (IBC). Any building or structure that falls within the scope of the IBC that is proposed in a flood hazard area is to be designed in accordance with ASCE 24. This document is available for purchase.

Building Resilience In Boston: "Best Practices" for Climate Change Adaptation and Resilience for Existing Buildings

Boston Green Ribbon Commission (2013)

A Boston Society of Architects-initiated report for the Boston Green Ribbon Commission and the city recommending safeguards for Boston in the face of climate change. This report provides a better understanding of the strategies and measures that property owners can use to reduce their vulnerability to climate change.

FEMA Mitigation Assessment Team Reports

Federal Emergency Management Agency (FEMA)

Mitigation Assessment Team (MAT) reports document observations made during field visits conducted by each MAT following extreme weather events, specifically deployed to evaluate key building damages. Each report presents the conclusions and recommendations derived from the field observations regarding key engineering concepts, codes and standards, mitigation measures and considerations that can be used in the planning and recovery process to help minimize future damage to structures and their related utility systems.

Fortified for Safer Business Standards for Businesses

Insurance Institute for Business and Home Safety (IBHS)

FORTIFIED for Safer BusinessTM is a code-plus new construction program that offers a package of improvements that greatly increase a new light commercial building's durability and resilience to natural hazards. Recommended for medical office buildings and ambulatory settings. IBHS' FORTIFIED for Safer BusinessTM program is now referenced and exemplified in the National Institute of Building Sciences ***Whole Building Design Guide***.

Green Building and Climate Resilience: Understanding impacts and preparing for changing conditions

University of Michigan and U.S. Green Building Council (2011)

The body of this report summarizes the most recent research on the likely impacts of climate change at various scales: regional, neighborhood, and site or building. The report includes predicted climate changes by region, and whenever possible, presents a range of predicted future characteristics in the categories of temperature, precipitation, coastlines, air quality, pests, and fires. It explores how climate change mitigation and adaptation efforts at all scales interact synergistically, with a focus on how green building professionals can approach adaptation in the built environment.

Mitigation Assessment Team Report Spring 2011 Tornadoes: April 25-28 and May 22; Building Performance Observations, Recommendations, and Technical Guidance

Federal Emergency Management Agency (FEMA) (2012)

The Southeastern and Midwestern portions of the United States experienced historic tornado activity in the spring of 2011. The Federal Insurance and Mitigation Administration of the U.S. Department of Homeland Security is responsible for investigating the effect of such events on the built environment. In response to a request for technical support from the FEMA Regional offices in the impacted states, FEMA deployed a Mitigation Assessment Team (MAT) to investigate the damage and provide technical assistance to the affected communities through their Joint Field Offices established in response to the events.

Mitigation Assessment Team Report Midwest Floods of 2008 in Iowa and Wisconsin: Building Performance Observations, Recommendations, and Technical Guidance

Federal Emergency Management Agency (FEMA) (2009)

In response to the 2008 Midwest floods, FEMA deployed a Mitigation Assessment Team (MAT) to evaluate and assess the damages caused by the riverine flooding in Iowa and southern Wisconsin. This report documents the MAT's observations, conclusions, and recommendations on the performance of buildings and other structures impacted by the flooding.

Mitigation Assessment Team Report Hurricane Sandy in New Jersey and New York: Building Performance Observations, Recommendations, and Technical Guidance

Federal Emergency Management Agency (FEMA) (2013)

In response to Hurricane Sandy, FEMA deployed a Mitigation Assessment Team (MAT) to evaluate damage from Hurricane Sandy, document observations, and based on these, offer conclusions and recommendations on the performance of buildings and other structures affected by flood and wind forces. The MAT's conclusions and recommendations in this report are intended to provide decision makers, designers, contractors, planners, code officials, industry groups, government officials, academia, homeowners, and business owners and operators with information and technical guidance that can be used to reduce future hurricane damage.

Recommended Physical Plant Improvements to Existing Nursing Homes for Disaster Preparedness

Florida Agency for Health Care Administration (1999)

Following the devastation caused by Hurricane Andrew in 1992, new research and study were given to the subject of improving hurricane protection strategies for the built environment. This report recommends construction improvements and standards to protect the physical plant or structural capability of the facility for nursing homes in case of disaster.

Risk Management Series: Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds (FEMA 577)

Federal Emergency Management Agency (FEMA) (2007)

The intent of the Design Guide is to provide its audience with state-of-the-art knowledge on the variety of vulnerabilities faced by hospitals exposed to earthquakes, flooding, and high-winds risks, as well as the best ways to mitigate the risk of damage and disruption of hospital operations caused by these events. The information presented in this publication provides an exhaustive review of mitigation measures and design solutions that can improve the safety of hospitals in natural hazard events.

Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms (FEMA P-361)

Federal Emergency Management Agency (FEMA) (2015)

This publication presents design, construction, and operation criteria for both residential and community safe rooms that will provide near-absolute life safety protection during tornado and hurricane events. It provides guidance for architects, engineers, building officials, local officials, and emergency managers, and prospective safe room owners and operators about the design, construction, and operation of community safe rooms in extreme-wind events.

Understanding Your Risks: Identifying Hazards and Estimating Losses—State and Local Mitigation Planning How-To Guide #2 (FEMA 386-2)

Federal Emergency Management Agency (FEMA) (August 2001)

This FEMA mitigation planning guide provides step-by-step guidance on how to perform a risk assessment for use by State, Tribal, and local planning teams in the natural hazard mitigation planning process. This risk assessment process focuses attention on areas most in need by evaluating which populations and facilities are most vulnerable to natural hazards.

Whole Building Design Guide, a program of the National Institute of Building Sciences

National Institute of Building Sciences

The Whole Building Design Guide is the only web-based portal providing government and industry practitioners with one-stop access to up-to-date information on a wide range of building-related guidance, criteria, and technology from a "whole buildings" perspective. It is currently organized into eight major categories: Design Guidance, Project Management, Operations & Maintenance, Documents and References, Tools, Continuing Education, Building Information Modeling and Applied Research. The "whole building" concept is an integrated design approach to achieve high-performance buildings.

ASHRAE 169-2013: Climatic Data for Building Design Standards

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) (2013)

This standard was created to provide a comprehensive set of climate data for those engaged in building design. The standard includes a variety of climatic information used primarily in the design, planning, and sizing of building energy systems and equipment. ASHRAE anticipates that the information within will represent a valuable resource for referencing in building design standards.

Baby It's Cold Inside

Urban Green Council (2014)

Without electricity, buildings are dependent on whatever protection is provided by their walls, windows, and roof. In today's buildings, that protection is modest at best. Only some buildings are constructed well enough to maintain their indoor temperatures without power. This website and report argue that resilient, high-performing buildings must become the new normal.

Environmental Building News Calls for "Passive Survivability"

Building Green (2005)

In an age of increasing concern about natural disasters, terrorism, blackouts, heat waves, and fuel supply interruptions, all houses and school buildings should incorporate "passive survivability" features. The term passive survivability is used to describe a building's ability to maintain critical life-support conditions in the event of extended loss of power, heating fuel, or water, or in the event of extraordinary heat spells.

Passive Survivability: A New Design Criterion for Buildings

Building Green (2006)

In December 2005 an editorial in Environmental Building News (EBN) introduced the concept of "passive survivability," or a building's ability to maintain critical life-support conditions if services such as power, heating fuel, or water are lost, and suggested that it should become a standard design criterion for houses, apartment buildings, schools, and certain other building types (EBN Vol. 14, No. 12). In this article, EBN examines the concept of passive survivability in greater detail and addresses some specific strategies that can be employed in adopting this design criterion for buildings.