Floodproofing Resources

Information about Multiple Floodproofing Techniques

- *Protecting Your Home and Property from Flood Damage: Mitigation Ideas for Reducing Flood Losses*, FEMA P-805 (2010), http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=4654 – information about repairing a flood-damaged house and reducing the risk of future flood damage
- *Homeowner's guide to Retrofitting: Six Ways to Protect Your House from Flooding*, FEMA P-312 (2009), http://www.fema.gov/library/viewRecord.do?id=1420 – information about floodproofing options and guidance to help in decision making; designed for readers who have little or no knowledge about flood protection methods or building construction techniques
- *Repairing Your Flooded Home*, FEMA P-234 (2010), http://www.fema.gov/library/viewRecord.do?id=1418 – detailed advice on post-flood cleanup and repair; includes information about preparing for the next flood
- *Flood Proofing: How to Evaluate Your Options*, U.S. Army Corps of Engineers (1993), http://www.nwo.usace.army.mil/nfpc/fphow/ace8.htm – information to assist with determining whether or not floodproofing is appropriate and which technique is the best measure to consider; includes a benefit/cost analysis technique
- *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA 551 (2007), http://www.fema.gov/library/viewRecord.do?id=2737 – guidance for community officials developing mitigation projects that reduce or eliminate identified risks for flood-prone structures
- *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures*, FEMA 259 (2001), http://www.fema.gov/library/viewRecord.do?id=1645 – detailed manual (over 800 pages) for engineers, architects, and building officials on engineering considerations for retrofitting flood-prone buildings; includes information about evaluating structures, hazard identification, economic analysis, alternative selection, and design criteria
- *Flood Proofing Systems and Techniques: Examples of Flood Proofed Structures in the United States,* http://www.nwo.usace.army.mil/nfpc/fpsys/ace9.htm – illustrates various types of floodproofing techniques with numerous examples for new construction and retrofitting of existing buildings

Flood Resistant Materials and Construction

- *Flood Damage-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas*, Technical Bulletin 2 (2008), http://www.fema.gov/library/viewRecord.do?id=1580 – information about requirements for flood-damage resistant materials and a table describing five classes of building materials ranging from those that are highly resistant to floodwater damage to those that have no resistance to flooding

- *Flood Resistant Design and Construction,* American Society of Civil Engineers (ASCE) 24-05, purchase at www.asce.org, highlights available at http://www.fema.gov/library/viewRecord.do?id=3515 – ASCE 24 is a referenced standard in the NYS Residential and Building Codes. It includes standards for resisting flood loads and flood damage and for dry floodproofing of nonresidential buildings

Elevation and Relocation of Buildings

- *Above the Flood: Elevating Your Floodprone House,* FEMA 347 (2000), http://www.fema.gov/library/viewRecord.do?id=1424 – description of alternative techniques that can be used to elevate existing floodprone buildings and case studies of homes in south Florida that were elevated above the 100-year flood level following Hurricane Andrew
- *Protecting Manufactured Homes from Floods and Other Hazards*, FEMA P-85 (2009), http://www.fema.gov/library/viewRecord.do?id=1577 – technical guidance on elevating and anchoring manufactured homes
- *Raising and Moving the Slab-on-Grade House with Slab Attached*, U.S. Army Corps of Engineers (1990), http://www.nwo.usace.army.mil/nfpc/fpslab/ace2.htm – description of the steps taken to raise and relocate a slab-on-grade structure

Dry Floodproofing

- *Non-Residential Floodproofing - Requirements and Certification for Buildings Located in Special Flood Hazard Areas,* Technical Bulletin 3-93 (1993), http://www.fema.gov/library/viewRecord.do?id=1716 – guidance on the NFIP regulations concerning watertight construction and the required certification for floodproofed non-residential buildings
- *Below-Grade Parking Requirements for Buildings Located in Special Flood Hazard Areas*, Technical Bulletin 6-93 (1993), http://www.fema.gov/library/viewRecord.do?id=1719 – guidance on NFIP regulations concerning the design of dry-floodproofed below-grade parking garages for non-residential buildings

Wet Floodproofing

- *Wet Floodproofing Requirements for Structures Located in Special Flood Hazard Areas*, Technical Bulletin 7-93 (1993), http://www.fema.gov/library/viewRecord.do?id=1720 – guidance on regulations concerning wet floodproofing; includes planning, safety, and engineering considerations

<u>Protecting Utilities and Equipment</u>

- FEMA fact sheets about various techniques for **Protecting Your Property from Flooding**, http://www.fema.gov/library/viewRecord.do?id=3262
  - *– Install Sewer Backflow Valves*
  - *– Anchor Fuel Tanks*
  - *– Raise Electrical System Components*
  - *– Build with Flood Damage Resistant Materials*
- *Protecting Building Utilities from Flood Damage: Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems,* FEMA P-348 (1999), http://www.fema.gov/library/viewRecord.do?id=1750 – technical guidance for the design and construction of flood-resistant utility systems for new buildings and modifications to utility systems in existing buildings; includes HVAC systems, fuel systems, electrical systems, sewage management systems, and potable water systems

- *Elevator Installation for Buildings Located in Special Flood Hazard Areas*, Technical Bulletin 4 (2010), http://www.fema.gov/library/viewRecord.do?id=1717 – guidance concerning the installation of elevators below the Base Flood Elevation

Flood Vents

- *Openings in Foundation Walls and Walls of Enclosures,* Technical Bulletin 1 (2008), http://www.fema.gov/library/viewRecord.do?id=1579 – provides guidance for non-engineered and engineered flood openings
- *Flood Venting in Foundations and Enclosures Below Design Flood Elevation*, NYS Department of State Technical Bulletin (2008), http://www.dos.state.ny.us/DCEA/pdf/TBfloodvent07.pdf

Floodplain Management

- **Southern Tier Central Regional Planning and Development Board** has developed fact sheets and forms to assist with regulation of floodplain development. These and other flood risk information are available at http://www.stcplanning.org/index.asp?pageId=108. Fact sheets are:
  - *Floodplain Facts #1: Floodplain Development*
  - *Floodplain Facts #2: Non-Building Floodplain Development*
  - *Floodplain Facts #3: Modifications to Existing Floodplain Structures*
  - *Floodplain Facts #4: Residential Structures in the Floodplain*
  - *Floodplain Facts #5: Non-Residential Structures in the Floodplain*
  - *Floodplain Facts #6: Manufactured Homes, Recreational Vehicles, and Trailers in the Floodplain*
  - *Floodplain Facts #7: Accessory Structures and Garages in the Floodplain*
  - *Floodplain Facts #8: Enclosed Areas Below the Flood Protection Level*
  - *Floodplain Facts #9: Flood Resistant Design*
  - *Floodplain Facts #10: Floodplain Development in Approximate A Zones*
  - *Floodplain Facts #11: Development in Areas of Shallow Flooding*
  - *Floodplain Facts #12: Floodway Encroachments*
  - *Floodplain Facts #13: Floodplain Variances*
- ***Floodplain Management Bulletin on Historic Structures***, FEMA P-467-2 (2008), http://www.fema.gov/library/viewRecord.do?id=3282 – regulatory information and floodproofing options for historic structures located in regulated floodplains

Certificates

- FEMA Elevation Certificate and Instructions, http://www.fema.gov/library/viewRecord.do?id=1383
- *Floodplain Management Bulletin on the Elevation Certificate*, FEMA 467-1 (2004), http://www.fema.gov/library/viewRecord.do?id=1727 – frequently asked questions about use of the Elevation Certificate to verify compliance with floodplain development standards
- FEMA Floodproofing Certificate for Non-Residential Structures, http://www.fema.gov/library/viewRecord.do?id=1600

Additional Resources

- **FEMA's Benefit-Cost Analysis** methodology and tools are used to evaluate cost effectiveness for grant applications (http://www.fema.gov/government/grant/bca.shtm)
- **National Nonstructural / Flood Proofing Committee** supervises research and provides technology transfer on floodproofing techniques (http://www.nwo.usace.army.mil/nfpc)