

\$10.00

MAINE FLOODPLAIN MANAGEMENT HANDBOOK

**A Resource Tool for Land Use Certification in the
Code Enforcement Officer Training and Certification Program
and a Reference for Other Professionals**



Patriot's Day Flood 2007 Saco (Camp Ellis) Maine

**A Publication of the
Maine Floodplain Management Program**

March 2019



The most recent revision of this manual was prepared by the Maine Floodplain Management Program in the Department of Agriculture, Conservation and Forestry. Some of the revision material in this handbook comes from the course "Managing Floodplain Development through the National Flood Insurance Program" established by FEMA and taught at the Emergency Management Institute.

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The Maine Floodplain Management Program does not discriminate on the basis of disability in admission to, access to, or operations of its programs, services, or activities. This material is available in alternate format by contacting the Coordinator for the American Disabilities Act (ADA).



Above:

(Saco, ME) Camp Ellis beachfront property after the April 2007 nor'easter. Photo by Brigitte Ndikum-Nyada, Maine Floodplain Management Program

Cover photo: *(Saco, ME) Camp Ellis after the April 2007 storm. Photo by Brigitte Ndikum-Nyada, Maine Floodplain Management Program*

MAINE FLOODPLAIN MANAGEMENT PROGRAM

Sue Baker, CFM, National Flood Insurance Program State Coordinator
Janet Parker, CFM, Planner

Maine Floodplain Management Program

17 Elkins Lane, 93 State House Station

Augusta, Maine 04333-0038

Phone: (207) 287-2801

Fax: (207) 287-2353

<https://www.maine.gov/dacf/flood/index.shtml>

This document contains hyperlinks to the web pages.

ADDITIONAL STATE AND FEDERAL TECHNICAL ASSISTANCE RESOURCES

Federal Emergency Management Agency – Region I

Karl Anderson, Floodplain Management Specialist

Maine Liaison, National Flood Insurance Program

99 High Street, 6th Floor

Boston, MA 02110-2132

Phone: (617) 956-7618

Karl.Anderson@fema.dhs.gov

Federal Emergency Management Agency – Region I

Richard Nicklas, Floodplain Management and Insurance
Branch Chief

99 High Street

Boston, MA 02110-2132

Phone: (617) 956-7671

Richard.Nicklas@fema.dhs.gov

Federal Emergency Management Agency – Region I

Kerry Bogdan, Chief, Risk Analysis Branch

99 High Street

Boston, MA 02110

(617) 956-7576

Kerry.Bogdan@fema.dhs.gov

Federal Emergency Management Agency – Region 1

Bob Desaulniers, Senior Insurance Liaison

National Flood Insurance Program

99 High Street

Boston, MA 02110-2132

Phone: (617) 832-4760

robert.desaulniers@fema.dhs.gov

Thomas Young, CPCU, CFM, ANFI, Insurance Liaison

Region I, NFIP Manager

Bureau & Statistical Agent

PO Box 16321

Hooksett, NH 03106

(603) 625-5125

Thomas.Young@associates.fema.dhs.gov

FEMA Map Service Center

P.O. Box 1038

Jessup, MD 20794-1038

Phone: 1-(877) FEMA MAP (1-877-336-2627)

FEMAMapSpecialist@riskmapcdfs.com

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FEMA LOMC Clearinghouse

847 South Pickett Street

Alexandria, VA 22304-4605

Phone: (877) 336-2627

FEMAMapSpecialist@mapmodteam.com

ISO Commercial Risk Services, Inc.

Eugene Kohls, CFM

Community Rating System

400 Crown Colony Drive, Suite 201

Quincy, MA 02169

Phone: (305) 202-1780

EKohls@verisk.com

Maine Emergency Management Agency

Anne Fuchs, State Hazard Mitigation Officer

45 Commerce Center

Augusta, Maine 04333

Phone: (207) 624-4466 or (800) 452-8735

anne.p.fuchs@maine.gov

U.S. Army Corps of Engineers - New England District

John Kennelly

696 Virginia Road

Concord, MA 01742-2751

Phone: (978) 318-8505 Fax: (978) 318-8080

john.r.kennelly@usace.army.mil

U.S. Army Corps of Engineers Maine Project Office

Permitting Assistance

Jay Clement

442 Civic Center Drive, Suite 350

Augusta, Maine 04330

Phone: (207) 623-8367 Fax: (207) 623-8206

jay.l.clement@usace.army.mil

U.S.D.A. Natural Resources Conservation Service

Daniel Baumert
967 Illinois Avenue, Suite 3
Bangor, Maine 04401
Phone: (207) 990-9100, (207) 990-9555
dan.baumert@usda.gov

U.S. Geological Survey

Greg Stewart
196 Whitten Road
Augusta, Maine 04330
Phone: (207) 626-6618 Fax: (207) 622-8204
gstewart@usgs.gov

Maine Geological Survey

Pete Slovinsky, Coastal Geologist
93 State House Station
17 Elkins Lane
Augusta, Maine 04333
Phone: (207) 287-2801 Fax: (207) 287-2353
peter.a.slovinsky@maine.gov

Maine Department of Transportation

Bridge Program
Michael Wight
16 State House Station
Augusta, Maine 04333-0016
Phone: (207) 624-3435 Fax: (207) 624-3491
michael.wight@maine.gov

Survey Section

Harold Nelson
Phone: (207) 624-3517 or (207) 624-3401
Harold.Nelson@maine.gov

DHHS-Division of Environmental Health **Subsurface Wastewater Program**

David Braley
286 Water Street
Augusta, Maine 04333-0010
Phone: (207) 441-5324 Fax: (207) 287-4172
david.braley@maine.gov

Professional and Financial Regulation **Oil & Solid Fuel Board**

Robert LeClair
35 State House Station
Augusta, Maine 04333-0035
Phone: (207) 624-8603 Fax: (207) 624-8637
robert.v.leclair@maine.gov

Land Use Planning Commission

Nicholas Livesay, Executive Director
22 State House Station
Augusta, Maine 04333-0022
Phone: (207) 287-2631 Fax: (207) 287-7439
Nicholas.Livesay@maine.gov

Bureau of Land Resources
Central Maine Regional Office - Augusta
Shoreland Zoning
Colin Clark, State Coordinator
17 State House Station
Augusta, Maine 04333-0017
Phone: (207) 441-7419 Fax: (207) 287-7826
colin.a.clark@maine.gov
On-Call 800-452-1942

Eastern Maine Regional Office - Bangor
Shoreland Zoning
Dawn Hurd
106 Hogan Road
Bangor, Maine 04401
Phone: (207) 356-8318 Fax: (207) 941-4584
dawn.hurd@maine.gov
On-Call 888-769-1137

Southern Maine Regional Office - Portland
Shoreland Zoning
Vacant
312 Canco Road
Portland, Maine 04103
Phone: (207) 822-6300 Fax: (207) 822-6303
On-Call 888-769-1036

Northern Maine Regional Office - Presque Isle
Shoreland Zoning
On-Call
1235 Central Drive
Presque Isle, Maine 04769
Phone: 888-769-1053 Fax: (207) 760-3143

Sand Dune Regulations

Please use On-Call System
Augusta: (207) 287-7688, (800) 452-1942
Bangor: (207) 941-4570, (888) 769-1137
Portland: (207) 822-6300, (888) 769-1036
Presque Isle: (207) 764-0477, (888) 769-1053

Hydropower and Dams

Federal Energy Regulatory Commission (FERC)

Kathy Davis Howatt
Central Maine Regional Office – Augusta
17 State House Station
Augusta, Maine 04333-0017
Phone: 207-446-2642 Fax: (207) 287-7826
kathy.howatt@maine.gov

Maine Department of Environmental Protection

MAINE REGIONAL PLANNING COMMISSIONS

Androscoggin Valley Council of Governments

Shelly Norton, Land Use Technical Assistance
125 Manley Road
Auburn, Maine 04210
Phone: (207) 783-9186 Fax: (207) 783-5211
snorton@avcog.org

Greater Portland Council of Governments

Jessa Berna, Land Use Technical Assistance
970 Baxter Boulevard, 2nd Floor
Portland, ME 04103
Phone: (207) 774-9891 Fax: (207) 774-7149
jberna@gpcog.org

Hancock County Planning Commission

Sheri Walsh, Land Use Technical Assistance
395 State Street
Ellsworth, Maine 04605
Phone: (207) 667-7131 Fax: (207) 667-2099
hcpc@hpcme.org

Kennebec Valley Council of Governments

Joel Greenwood, Land Use Technical Assistance
17 Main Street
Fairfield, Maine 04937
Phone: (207) 453-4258 Fax: (207) 453-4264
jgreenwood@kvcog.org

Lincoln County Regional Planning Commission

Megan McLaughlin, Regional Planner
297 Bath Road
Wiscasset, Maine 04578
Phone: (207) 882-4271 Fax: (207) 784-6118
mmclaughlin@lcrpc.org

Mid-Coast Regional Planning Commission

James Francomano, Land Use Technical Assistance
639 Main Street - Steel House South
Rockland, Maine 04841
Phone: (207) 594-2299 Fax: (207) 594-4272
mcrpc@midcoast.com

Midcoast Economic Development District

Bill Najpauer, Land Use Planner
165 Main Street, Suite 2D
PO Box 62
Damariscotta, Maine 04530
Phone: (207) 370-6045 Fax: (207) 443-8675
bnajpauer@mceddme.org

Northern Maine Development Commission

Jay D. Kamm, Land Use Technical Assistance
11 West Presque Isle Road, P.O. Box 779
Caribou, Maine 04736
Phone: (207) 498-8736 Fax: (866) 493-1388
jkamm@nmddc.org

Southern ME Regional Planning Commission

Abbie Sherwin, Land Use Technical Assistance
110 Main Street, Suite 1400
Saco, Maine 04072
Phone: (207) 571-7065 Fax: (207) 571-7068
asherwin@smpdc.org

Washington County Council of Governments

Judy East, Executive Director
P.O. Box 631
11 Church Street
Calais, Maine 04619
Phone: (207) 454-0465 Fax: (207) 454-2568
jceast@wccog.net

COUNTY EMERGENCY MANAGEMENT AGENCIES

Androscoggin Unified Emergency Management Association

Joanne Potvin, Director
2 College Street
Lewiston, Maine 04240-7101
Phone: (207) 784-0147 Fax: (207) 795-8938
jpotvin@androscoggincountymaine.gov

Aroostook County Emergency Management Agency

Darren Woods, Director
158 Sweden Street
Caribou, Maine 04736
Phone: (207) 493-4328 Fax (207) 493-4357
darren@aroostookema.com

Cumberland County Emergency Management Agency

Joseph Chappell, Director
22 High Street, Unit 1
Windham, Maine 04062
Phone: (207) 892-6785
chappell@cumberlandcounty.org

Franklin County Emergency Management Agency

Tim Hardy, Director
140 Main Street, Suite 1
Farmington, Maine 04938
Phone: (207) 778-5892 Fax (207) 778-5894
thardy@franklincountymaine.gov

Hancock County Emergency Management Agency

Andrew Sankey, Director
County Courthouse, 50 State Street, Suite 4
Ellsworth, Maine 04605
(207) 667-8126
ema@co.hancock.me.us

Kennebec County Emergency Management Agency

Sean Goodwin, Director
125 State Street
Augusta, Maine 04330
Phone: (207) 623-8407
kclepc@gwi.net

Knox County Emergency Management Agency

Ray Sisk, Director
62 Union Street
Rockland, Maine 04841
(207) 594-0420 Fax (207) 594-0443
sebema@knoxcounty.midcoast.com

Lincoln County Emergency Management Agency

Casey Stevens, Director
32 High Street, PO Box 249
Wiscasset, Maine 04578
(207) 882-7559
cstevens@lincounty.me

Penobscot County Emergency Management Agency

Michelle Tanguay, Director
69 Hammond Street
Bangor, Maine 04401
Phone: (207) 945-4750 Fax (207) 942-8941
ema@penobscot-county.net

Oxford County Emergency Management Agency

Allyson Hill, Director
26 Western Avenue, PO Box 179
South Paris, Maine 04281
Phone: (207) 743-6336 Fax (207) 743-7346
ema@oxfordcounty.org

Piscataquis County Emergency Management Agency

Thomas Capraro, Director
163 East Main Street
Dover-Foxcroft, Maine 04426
Phone: (207) 564-8660 Fax (207) 564-3022
pcema@myfairpoint.net

Sagadahoc County Emergency Management Agency

Sarah Bennett, Director
752 High Street, P.O. Box 246
Bath, ME 04530
(207) 443-8210 Fax (207) 443-8212
sbennett@sagcounty.com

Somerset County Emergency Management Agency

Michael Smith, Director
8 County Drive
Skowhegan, Maine 04976
(207) 474-6788 Fax (207) 474-0879
msmith@somersetcounty-me.org

Waldo County Emergency Management Agency

Dale Rowley, Director
45A Congress Street
Belfast, Maine 04915
(207) 338-3870
emadirector@waldocountyme.gov

Washington County Emergency Management Agency

Lynn Dwelley, Director
34 Center Street, P.O. Box 297
Machias, Maine 04654
(207) 255-3931
wnema@washingtoncountymaine.com

York County Emergency Management Agency

Arthur Cleaves, Director
149 Jordan Springs Road
Alfred, Maine 04002
(207) 324-1578
awcleaves@yorkcountymaine.gov

PROLOGUE



Aerial view of the Presumpscot River at the intersection of Route 302 in Westbrook, Maine on October 22, 1996.

WHAT IS A FLOOD?

Under the [National Flood Insurance Program \(NFIP\)](#), a “flood” or “flooding” is defined as:

- a. A general and temporary condition of partial or complete inundation of normally dry land areas from:
 1. the overflow of inland or tidal waters; or
 2. the unusual and rapid accumulation or runoff of surface waters from any source.
- b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of one of several causes: erosion; undermining caused by waves or currents of water that exceed anticipated cyclical levels; an unusually high water level in a natural water body, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge; another similarly unusual and/or unforeseeable event that results in flooding as defined in paragraph (a)(1) of this definition.

WHY IS IT IMPORTANT TO MANAGE FLOODPLAINS?

Floodplain management practices have evolved over the past century to include preventive efforts that reduce the cost of recovery from flooding disasters. Your community can reduce the loss of life and greatly reduce property damage due to flooding by taking a number of steps. One of these steps is to join the [National Flood Insurance Program \(NFIP\)](#).

Communities that choose to participate in the NFIP adopt a resolution to join the Program and then complete a one-page application. [Appendix H](#) includes a sample resolution and a copy of the application form. The community then adopts an ordinance (see Chapter 1 for sample ordinance) to regulate development in flood hazard areas. There is no fee to join the Program. The cost of administering the floodplain ordinance is generally offset by the fees charged for permits given to those who apply to build within the flood hazard area.

PROLOGUE



Aerial view of the Kennebec River at the intersection of Lithgow Street in Winslow, Maine, on April 1, 1987.

Another important step a community should undertake is proper planning for land use within flood hazard areas. When preparing a comprehensive plan, careful consideration should be given to floodplain planning. It is important to guide new development away from the high-risk areas. [Regional planning commissions](#) (listed on the State FPM web site) can be helpful with this process, as can technical contacts with the [Association of State Floodplain Managers \(ASFPM\)](#). New infrastructure should not be invested in areas that are floodprone. Roads and bridges are very expensive to maintain and replace when damaged by frequent flooding. The repair and replacement costs must be borne by the taxpayers of the town since flood insurance is not available for damages to infrastructure.

Floodplains also serve natural and beneficial functions, providing areas in which to direct flood waters during periods of heavy rainfall and runoff; providing areas for recharging the ground water; and providing natural habitat for plants and wildlife. Many cities and towns now recognize the recreational value of floodplains.

This handbook is intended to assist Maine municipalities, individuals, professionals, and citizens who are interested in good floodplain management. The program is designed, not just to encourage floodplain management by meeting the [minimum NFIP standards](#), but also to develop standards that go beyond the minimum and establish a solid foundation for reducing the risk of flooding in the community.

This manual is a dynamic document. It undergoes ongoing revision based on feedback from local officials and other professionals concerned about effective floodplain management. Please call the staff in the State of Planning Office, Floodplain Management Program at (207) 287-3261, or visit the Maine Program online at <http://www.maine.gov/spo/flood>. We welcome your input, including concerns, questions, or recommendations on how we can improve either this manual or the MFMP.

MAINE FLOOD FACTS

- There are 5,779 lakes and ponds in Maine.
- There are 3,500 miles of coastline in Maine.
- There are 2.772 square miles of floodplain in Maine.

MAINE FLOODPLAIN MANAGEMENT PROGRAM

Flooding in Maine is largely the result of coastal storms, heavy spring rains, runoff, and ice jams. This flooding has been responsible for millions of dollars of property damage. Private flood insurance is unavailable – insurers consider the risk of loss as being exceedingly high. It has been estimated that approximately 33,000 structures in Maine are floodprone. Your community can assist citizens in protecting their property from losses due to flooding by joining the

PROLOGUE

[NFIP](#). For more information, contact the [Maine Floodplain Management Program \(MFMP\)](#) in the [State Planning Office](#). This Program assists communities in administering NFIP guidelines and practices.

Participation in the voluntary NFIP program provides value to communities and their residents. In exchange for a community's commitment to practice sound land use management, residents are able to purchase flood insurance (provided by the NFIP) that will cover all or part of their home losses in the event of a flood. Currently, there are over 8,000 flood insurance policies in effect in Maine, with coverage approaching \$1.5 billion (**Source:** FEMA NFIP statistical report). Mortgage lending and disaster assistance programs are severely limited in communities that do not participate in the NFIP. The [NFIP online program](#) page addresses these issues.

The MFMP provides technical information, floodplain maps, and model ordinances to communities that demonstrate interest in joining the NFIP, as well as to the homeowners, professional land surveyors, professional engineers, businesses, lenders, realtors, appraisers, site evaluators, other state and federal agencies, and others similarly interested in NFIP. MFMP staff members perform the following services, among others:

- workshops on reading and using flood maps, ordinance interpretation and floodplain management administration;
- review of local ordinances for compliance with the NFIP standards;
- assistance is to NFIP communities that exceed minimum floodplain management standards by becoming rated in the [Community Rating System \(CRS\)](#), which reduces flood insurance premiums for CRS communities;
- work with other state agencies to ensure that development that is coordinated through various state permit reviews is designed and developed to minimize the potential of damage from flooding;
- review [Community Development Block Grants \(CDBG\)](#) that are submitted to the state [Department of Economic and Community Development](#); and
- review development plans that are submitted to the [Department of Environmental Protection \(DEP\)](#) under the [Natural Resources Protection Act \(NRPA\)](#), and the [Department of Conservation \(DOC\)](#) to ensure that projects conform with the requirements of the National Flood Insurance Program as well as applicable laws for the site location.

Communities may also take advantage of technical assistance from both the Boston-based Federal Emergency Management Agency (FEMA) office (Region 1), and regional planning commissions. For more information contact [FEMA](#), the [Maine regional planning commissions](#), and other technical assistance resources as listed in this manual.

MAINE FLOODPLAIN MANAGEMENT HANDBOOK

The purpose of this handbook is to enhance the knowledge and skills of individuals responsible for floodplain management throughout the State of Maine. The manual was designed to broaden the understanding of floodplain management and the need to promote the wise use of floodplains, which are one of Maine's vital natural resources. This manual explains the floodplain regulation requirements of the NFIP. The introduction and seven chapters cover the topics shown as follows:

Prologue	Background on floodplain management and the Maine Floodplain Management Program.
<u>Introduction</u>	Early floodplain development, the objectives of floodplain management, and a history of the NFIP.
<u>Chapter I</u>	Model Floodplain Ordinances prepared by the State Planning Office, with assistance from the Maine Municipal Association and the Attorney General's Office. The ordinance, once adopted, is the legal authority for a community's floodplain regulatory program.
<u>Chapter II</u>	Technical data, such as flood elevations, Flood Insurance Rate Maps (FIRMs), and how these determine the level of regulation applicable to a specific land area.

PROLOGUE

[Chapter III](#)

Floodplain projects that are subject to regulation.

[Chapter IV](#)

Preventing increased damages.

[Chapter V](#)

Regulatory development standards that development must meet in order to ensure that the objectives of the regulations are achieved.

[Chapter VI](#)

How local government institutes a regulatory system that incorporates permitting procedures, administrative requirements, variances and enforcement issues.

[Chapter VII](#)

Additional floodplain management resources.

PROLOGUE

ACRONYMS

ACoE	Army Corps of Engineers	GIS	Geographic Information System
BFE	Base Flood Elevation	GPS	Global Positioning System
BOCA	Building Officials and Code Administrators	HAG	Highest Adjacent Grade
CAC	Community Assistance Contact	LAG	Lowest Adjacent Grade
CAV	Community Assistance Visit	LOMA	Letter of Map Amendment
CBRA	Coastal Barrier Resource Act	LOMR	Letter of Map Revision
CBRS	Coastal Barrier Resources System	MEMA	Maine Emergency Management Agency
CEO	Code Enforcement Officer	MFMP	Maine Floodplain Management Program
CFR	Code of Federal Regulations	MRSA	Maine Revised Statutes Annotated
CFS	Cubic Feet per Second	MSL	Mean Sea level
CRS	Community Rating System	NFIP	National Flood Insurance Program
DEP	Department of Environmental Protection	NGVD	National Geodetic Vertical Datum
DOT	Department of Transportation	NRCS	Natural Resource Conservation Service
EO	Executive Order	NSFHA	No Special Flood Hazard Area
FBFM	Flood Boundary and Floodway Map	NWS	National Weather Service
FDIC	Federal Deposit Insurance Corporation	PL	Public Law
FDPA	Federal Disaster Protection Act	PLS	Professional Land Surveyor
FEMA	Federal Emergency Management Agency	RM	Reference Mark
FERC	Federal Energy Regulatory Commission	RPC	Regional Planning Commission
FHA	Federal Housing Administration	S&L	Savings and Loan
FHBM	Flood Hazard Boundary Map	SBA	Small Business Administration
FIA	Federal Insurance Administration	SFHA	Special Flood Hazard Area
FIRM	Flood Insurance Rate Map	SPO	State Planning Office
FIS F	Flood Insurance Study	USACE	U.S. Army Corps of Engineers
FmHA	Farmers Home Administration	USC	United States Code
FPE	Flood Protection Elevation	USDA	U.S. Department of Agriculture
FPM	Floodplain Management	USGS	U.S. Geological Survey
FPMO	Floodplain Management Ordinance	VA	Veterans Administration

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- [B](#). Flood Hazard Development Application & Permits (Coastal E Model)
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- [G](#). Related Publications and Videos
- [H](#). NFIP Entry Information
- [I](#). Order Form for FEMA Flood Maps/On-line FEMA Flood Maps
- [J](#). Assorted Floodplain Management Articles
- [K](#). Biennial Report
- [L](#). Executive Order 11988
- [M](#). Benefits of Participation and Effects of Suspension from the NFIP
- [N](#). Protecting Your Property from Flooding: Anchoring Heating Oil/Propane Tanks – (FEMA 481 DVD Video)
- [O](#). Glossary

** Click on the Letter of the Appendix letter for a hyperlink to the document in the online version.*

INTRODUCTION

Chapter Summary

Rivers and streams are part of nature's system for carrying water from high ground down to the ocean. Floodplains are part of the system created for carrying unusually large amounts of water, i.e.: floods. Flooding is a natural process, and floodplains play a vital role in that process.

FLOODPLAINS AS NATURAL DRAINAGE AREAS



Photo by Bridget Weber, FEMA.

Under natural conditions, flooding causes little or no damage. Unfortunately, over the years, little regard has been given to the original purpose of floodplains. Floodplain preservation, and the associated concern for the safety of property and life, has been given little consideration when weighed against community development interests. Homes, businesses, and even whole communities have been built in flood hazard areas. This development of floodplains has resulted in continual and, often severe, social and economic loss.

Early decisions to locate in floodplains were driven partly by the fact that the waterways served as a means of transportation. Settlements relied on river boats and canoes for access to outside markets. Out of necessity, mills located on or near the waterways to take advantage of the hydropower. Because of the natural values of water, locating near a water body also provided access for domestic purposes such as drinking water and agriculturally fertile lands with easily tillable soil. Consequently, many of the United States major metropolitan areas were developed adjacent to a major waterway.

There is also a growing appreciation for locating along waterways for aesthetic and recreational reasons. These lands offer value, and the availability of land that is considered desirable for development is lessening. As many communities have exhausted some of the better, low-risk areas of the town, increasing pressure is put on local officials to allow development of "less expensive land." History has taught us that allowing development in these locations carries a price, financial and otherwise.

Along with the benefits associated with community development, development in floodprone areas has associated costs due to periodic flooding including:

- Loss of life (old estimates reported an average of 150 lives a year were lost to flooding). However, recent hurricane seasons have distorted the number of dead resulting from floods so much that any number given is likely to be challenged as an unrealistic average. Katrina alone account for more than 2,500 dead or lost.
- Disruption of businesses and communities. According to the Small Business Administration, many small businesses do not reopen after significant flooding events. They are unable to absorb the loss

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of business. Flood insurance does not cover the loss of business, only the damages or loss of the building and contents and of course they don't pay anything if the owner didn't carry flood insurance.

- Property and infrastructure damages averaged \$4.6 billion a year for the 20-year period 1984-1993. In the aftermath of the 2004 hurricane season some sources suggest that as Hurricanes Charlie, Ivan, Frances and Jeanne caused as much as \$45 billion in losses in Florida. The estimates from the hurricane season of 2005 when Katrina, Wilma and Rita hit the Gulf coast run from \$82 billion to \$122 billion depending on who was reporting and the actual costs may never really be known.

Flooding can occur in any of the 50 states or in the U.S. territories at any time of year. In most years, flooding causes more deaths and damage than any other type of severe weather. In many years, it is common for three-quarters of all federally declared disaster declarations to include a flooding component.

Cyclical flooding and related problems created led to government becoming involved in finding solutions to reduce flood losses. In the early half of the twentieth century, the typical government responses to flooding -- structural control and disaster relief -- were not totally effective in solving this problem. Despite large governmental expenditures, flood damages nationwide continued to rise. Floodplain management practices developed since then include the pro-active development of regulations that govern the location and structural characteristics of new construction. This is a more effective way to prevent flood damages from increasing. Rather than try to control flooding that damages properties, government should guide new development away from high-risk areas, however, if new construction or improvements must be located in a flood hazard zone, development should be controlled so that flood damages can be avoided.

The History of Flooding in Maine

An overview of Maine's flooding history

- 1923 the Kennebec floods
- March 1936: flood statewide. Five killed, \$25,000,000 in damages.
- March 1953 the little Androscoggin and Androscoggin, Lewiston and Auburn impacted.
- September 1954: Hurricane Edna. 8 deaths, \$7,000,000 in damages statewide.
- February 1978: Floods statewide. \$20,000,000 in damages.



Figure 10 - March 1936 Flood - Little Androscoggin River overflows between Main and South Main Streets, Auburn.

An overview of the larger floods to affect the state is included as a Power Point presentation on the home page of the [web site](#) of the Maine Floodplain Management Program.

What is Floodplain Management?

Floodplain management may be defined as the full range of public and private policy and action to:

- promote the wise use of floodplains,
- reduce flood losses, and
- protect the natural functions and values of floodplains.

Floodplain management directors coordinate several program measures:

- **structural** (dams, channel diversions, and levees);
- **non-structural** (floodplain development regulations, warning and preparedness, and flood insurance),
- **corrective**, to address existing problems (retrofitting); and
- **preventative, to avoid creating new problems (comprehensive planning and mitigation planning)**

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The purpose of this manual is to give the reader a better understanding of floods and flooding and what an individual or community can do reduce the impact of flooding on both the property owner and the community as a whole.

History of Floodplain Management

Since its earliest years, Americans have responded to floods in a variety of ways. The earliest response was for individuals to bear the losses and the costs associated with clean up and repair. In the late 1880s, Congress made an initial move to establish some Federal responsibility for flood forecasting and warning systems.

The Mississippi River Commission (1879)

In 1879, Congress created the Mississippi River Commission. In doing so, Congress directed the U.S. Army Corps of Engineers the authority and resources to develop the means necessary to prevent destructive floods from affecting life and property.

Flood Control Act of 1917

Direct Federal involvement in flood control began with the passage of the Flood Control Act of 1917, which authorized several specific flood control projects. Most of the projects were located along the Mississippi River. That same year, the United States Department of Agriculture (USDA) developed researched-based studies for rainfall and runoff measurements. These initial studies included the basic concepts and data for development of the rational method for computing maximum runoff.

Flood Control Act of 1928

Following the Great Flood of 1927, Congress gave the U.S. Army Corps of Engineers more responsibility for flood control and navigation on the Mississippi River.

TVA Act of 1933

This Act established the Tennessee Valley Authority and its regional program of resource development. The TVA established a number of hydro/flood control dams on inland waterways.

The United States-Mexico Convention of February 1, 1933

The Convention provided for stabilization and flood control of the international boundary along a 90-mile section of the Rio Grande River.

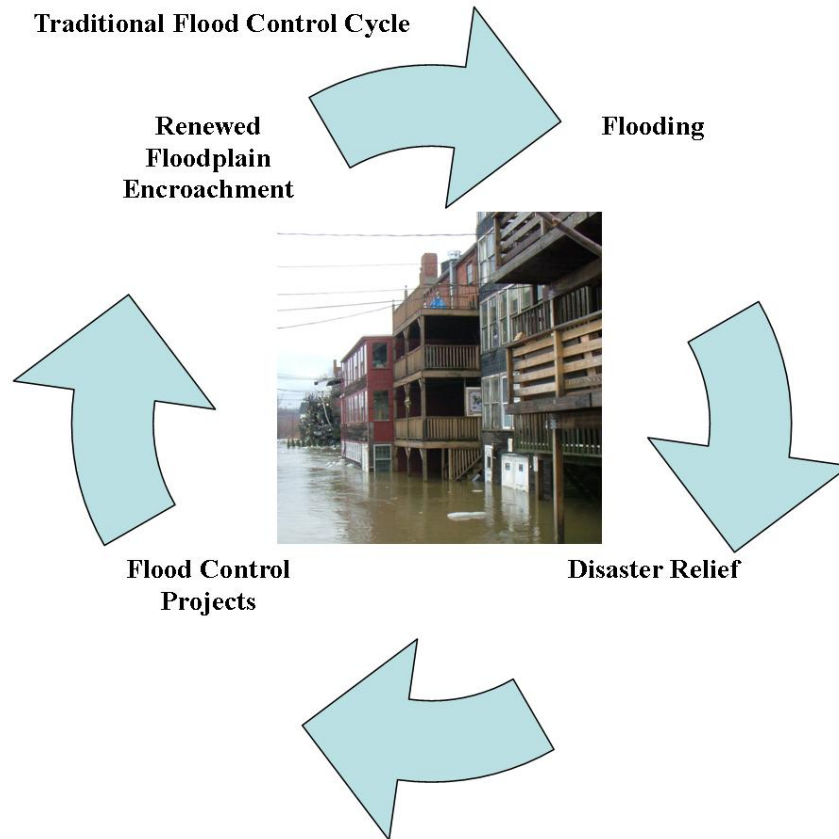
Flood Control Act of 1936

Significant federal flood control activity did not begin until the Flood Control Act of 1936 was passed. It was passed in response to a series of major floods on the Potomac, Susquehanna, and upper Ohio River Basins. This Act expanded Federal responsibility to all navigable rivers of the nation and authorized over 200 flood control projects in 31 states. It further extended the scope of federal involvement, assigning the federal government the full cost of building and maintaining dams, channel modifications, levees and floodwalls. Over the next 50 years, from 1936 to 1986, Congress authorized and built approximately 900 flood control projects including approximately 400 flood control dams, thousands of miles of levees, floodwalls, floodways and improved channels. With Congressional blessing, the U. S. Army Corps of Engineers was tasked with keeping the water away from the development, in essence, to attempt to conquer nature. Billions of dollars were spent on these structural "improvements."

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A well established (vicious) cycle was now in place:

flooding → disaster relief → flood control projects → renewed floodplain encroachment → repeated flooding



President Truman attempts a Flood Insurance bill in 1952

In spite of the billions spent on flood control projects, flood losses continued to rise rapidly due to continuing, extensive floodplain development. Billions of dollars continued to be spent on disaster relief. Many of the flood control structures built adversely affected our natural resources and environmental quality. Although federal flood control efforts saved many lives and billions of dollars in property damage, Congress realized that protective works alone would not stem the increase in flood losses. In 1952 President Truman asked Congress to consider a bill to establish a Federal flood insurance program after flooding in 1951, but Congress did not pass the bill. In 1955, major floods hit several parts of the country again, thereby reviving and broadening community interest in developing a national flood insurance program.

Flood Insurance Act of 1956

Congress passed the Flood Insurance Act of 1956 but it was never funded because the property insurance industry continued to oppose such a program due to its impracticability for business. In the 1960s, there was a shift in how the country approached flooding problems. This new perspective included a growing concern about limiting development near waterways and in the floodplain.

House Document 465 – 1966

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Congress began to recognize that protective works alone would not stem the increase in flood losses. This led to the creation of a presidential task force on Federal Flood Control Policy and the 1966 publication of House Document 465, "A Unified National Program for Managing Flood Losses." The document included five major goals:

- improve basic knowledge about flood hazard
- coordinate and plan new developments in the floodplain
- provide technical services to managers of floodplain property
- move toward a practical national program for flood insurance; and
- adjust federal flood control policy to support sound criteria and changing needs.

Southeast Hurricane Disaster Relief Act of 1965

In September 1965, at roughly the same time House Document 465-1966 was being developed, Hurricane Betsy killed 74 people and caused \$1.42 billion in damage (in 1965 dollars) in Louisiana, Florida and the Bahamas. This Act directed the Secretary of Housing and Urban Development to examine the feasibility of insurance and other programs for financial assistance to flood victims. The resulting report "Insurance and Other Programs for Financial Assistance to Flood Victims," along with "A Unified National Program for Managing Flood Losses" concluded in 1966 that a national program of flood insurance was both feasible and in the public interest. This led to the enactment of the National Flood Insurance Act of 1968.

The National Flood Insurance Act of 1968 (The creation of the National Flood Insurance Program)

In 1968 Congress passed the National Flood Insurance Act (42 USC 4001) to correct the shortcomings of traditional flood protection and flood relief programs. The National Flood Insurance Program (NFIP) makes flood insurance available to property owners in communities that agree to adopt an ordinance regulating development in floodprone areas. The combination of development regulations and insurance means that there is help for everyone already living in a floodplain. In addition, new construction is regulated to ensure that it is not subject to flood damage and does not impede or deflect flood flows. Insurance provides relief for even small floods, unlike disaster relief. It also means that floodplain residents are now paying for a greater share of the assistance program. More information about the structure of the NFIP and about flood insurance can be obtained from the Maine Floodplain Management Program or FEMA.

The intent of the NFIP is not to prohibit, but to **guide** development in floodplain areas in a manner consistent with both nature's need to convey flood waters and a community's land use needs. The floodplain regulations required by the NFIP are designed to accomplish two basic objectives related to flood damage protection:

- to prevent new developments from increasing flood damages to others, and
- to ensure that new buildings will be free from flood damage.

There are four basic components to floodplain regulation:

1. the area of the community where the floodplain regulations apply is identified and labeled as the floodplain, or Special Flood Hazard Area;
2. certain activities in the floodplain are brought under regulation;
3. the development standards for these activities are specified; and
4. a system to administer and enforce the rules is established.

The National Flood Insurance Act has been amended several times since it was enacted in 1968. Subsequent changes are addressed below.

1973 Flood Disaster Protection Act (FDPA)

In 1972, Hurricane Agnes demonstrated the ineffectiveness of the voluntary flood insurance program that was implemented in 1968. As a result, Congress passed the Flood Disaster Protection Act in 1973, which tightened the flood insurance program by providing sanctions, which were directed primarily to lending institutions. It was the most significant expansion of both the provisions and the national impact of the NFIP.

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This Act required:

- acceleration in the rate at which Flood Insurance Studies are conducted;
- notification to communities that they were identified as being floodprone; and
- creating mandatory requirements for purchasing flood insurance for loans that were backed by the federal government.

The notification process appears to be what got our Maine communities to join the Program. In looking at the files, the indications are that most communities joined between 1973 and 1975. The mandatory purchase requirement may have been a significant factor in their decision to join the NFIP. Any lending institution regulated by a federal instrumentality had to require flood insurance on any loan for a structure in the 100 year floodplain. This included, for example, the FDIC, FSLIC, SBA, VA, and FHA. Today this concept is often termed "the lender compliance issue." In recent decades, these requirements have resulted in an increase in the number of communities participating in the NFIP program; and an increase in the number of flood insurance policies purchased.

A study done by FEMA after the flood of April 1, 1987 determined that very few of those structures that should have had flood insurance were actually insured during the disaster. This indicated a lender problem. This problem and others spurred a national effort to increase the lender compliance. More information on lender compliance is available in FEMA publication 186, *Mandatory Purchase of Flood Insurance Guidelines* available from the Maine Floodplain Management Program or FEMA Region I.

Now, following most major flooding disasters, the federal government does an analysis to see how well the lending institutions did their job in that area. It usually is less than ideal. However, the lenders are now becoming aware of their responsibilities, and current indications appear that they are beginning to be very conservative in their review of flood hazard determinations. If there is a doubt, they are requiring flood insurance. In light of the S&L bailout and the poor performance in the flood insurance arena, the instrumentalities have tightened the reins on the lending institutions. Many municipalities have seen an increase in inquiries and continue to see a rise in outside interest in the NFIP.

[Executive Order 11988, 1977](#)

Executive Order 11988, Floodplain Management, addresses concerns about the potential loss of the natural and beneficial functions of the nation's floodplains as well as the increased cost to federal, state, and local governments from flooding disasters that are worsened by unwise development of the floodplain. When funding actions, Federal agencies are required to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA's procedures for implementing this Executive Order are found at Title 44 Part 9 of the Code of Federal Regulations (44 CFR 9). Section 9.6 of these procedures includes an eight-step process that decision-makers must use when considering projects that have potential impacts to or within a floodplain.

[Executive Order 11990, 1977](#)

The purpose of Executive Order 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to:

- Acquisition, management, and disposition of Federal lands and facilities construction and improvement projects, which are undertaken, financed or assisted by federal agencies;
- Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

[Coastal Barrier Resources Act of 1983](#)

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In 1983, the NFIP was amended again to prohibit new Federal expenditures or the sale of flood insurance in any Coastal Barrier area within the Coastal Barrier Resources System as identified by the Department of Interior. Undeveloped coastal barriers are along the Atlantic and Gulf coasts. The act was called the Coastal Barrier Resources Act of 1983 (also known as CBRA). The requirements are found in Part 71 of the NFIP Regulations. Even though a community participates in the Program, flood insurance may be denied in specially designated areas for any new construction or substantial improvement. The purpose of CBRA is to reduce the loss of life and property in these hazardous areas and to protect water quality and other coastal resources. The Act includes provisions that:

- deny Federal assistance (such as grants), flood insurance, and disaster assistance
- prohibit development in designated high hazard areas;
- define and identify undeveloped coastal barriers, and
- place a general prohibition on most Federal activities that might assist development of those barriers.

In 1992, many coastal communities in Maine received new Flood Insurance Rate Maps (FIRMs) because of an expansion in the Department of Interior's Coastal Barriers. Maine state law also prohibits development in Coastal Barriers (Title 38 MRSA §1901-1905).

The Robert T. Stafford Act 1988

The Stafford Act was passed in 1988 and became effective on May 22, 1989. The Robert T. Stafford Relief and Emergency Assistance Act retitled and amended the Disaster Relief Act of 1974. It limits disaster assistance available for damages to under insured or non insured public and non-profit structures. Section 406(d), Flood Insurance, states that Federal disaster assistance to restore insurable structures in special flood hazard areas will be reduced by the maximum amount of insurance proceeds that would have been received had the building and contents been fully covered by a standard policy available through the NFIP.

This is illustrated in a scenario wherein the sewer treatment plan of an NFIP community receives \$200,000 in damages during a flood. The community had previously elected to insure it for \$20,000. The amount of disaster assistance available to the community is reduced by the amount of additional insurance the community could have purchased (or \$180,000) if the property had been properly insured.

The 1994 Flood Insurance Reform Act

The National Flood Insurance Reform Act created several major changes in the National Flood Insurance Program. These changes include legislation to:

- improve compliance with mandatory purchase requirements;
- sets monetary penalties;
- create a new Mitigation Assistance Program;
- increase flood insurance coverage limits;
- increase the flood insurance policy waiting period to 30 days;
- create benefits for communities and property owners that implement mitigation measures;
- modify the Community Rating System
- require a study of the economic impact of mapping erosion hazard areas
- prohibit federal disaster assistance in cases where flood insurance has not been maintained; and
- requires a study of the economic effects of charging actuarially-based premium rates for pre-FIRM structures.

Disaster Mitigation Act of 2000 (DMA 2000)

The Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390) provides an opportunity for states, Tribes and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act) by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of mitigation plan requirements (Section

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322). This new section emphasizes the need for state, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts.

The requirement for a State mitigation plan is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the State level through the establishment of requirements for two different levels of state plans: “Standard” and “Enhanced.” States that demonstrate an increased commitment to comprehensive mitigation planning and implementation through the development of an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program (HMGP). DMA 2000 also established a new requirement for local mitigation plans and authorized up to 7% of HMGP funds available to a state to be used for development of state, Tribal, and local mitigation plans.

Previous to 2002, the Stafford Act included provisions only for Section 404 Mitigation under the Hazard Mitigation Grant (HMGP) program. The Act was modified in 2000, when there was an increase in the percentage of funding that could be allocated for HMGP projects. The Preliminary Disaster Assistance Program was also created.

The Flood Insurance Reform Act (FIRA) of 2004 (passed Senate Banking Committee)

The FIRA strengthened the standards of the National Flood Insurance Program (NFIP) by improving lender compliance. The bill also reauthorized the NFIP to make available nationwide flood insurance, to accelerate recovery from floods, mitigate future losses, save lives, reduce the personal and national cost of flood disasters, and provide a mechanism to deal with structures that experienced repetitive loss.

Local Community Recovery Act of 2006 (FAR Case 2006-014)

This interim rule adds a local area set-aside to the Federal Acquisition Regulation (FAR) for debris clearance, distribution of supplies, reconstruction, and other major disaster or emergency assistance activities. The contracting officer for the disaster defines the local set-aside area. The rule implements the Local Community Recovery Act of 2006, which strengthens the government's ability to promote local economic recovery. The local area set-aside does not replace small business set-asides. Both can be used at the same time. The rule imposes subcontracting restrictions when a local area set-aside is used. No competition justification is required for the local area set-aside.



Photo courtesy of the Maine Department of Transportation April 1, 1987

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Floodplain Management at the State Level

The State Coordinating Agency

The primary purpose of Maine's Floodplain Management Program is to reduce and prevent flood losses to lives and property by assisting communities with developing local floodplain management programs. The responsibilities of the State Coordinating Agency are spelled out in 44 CFR, Part 60.24. While not mandatory, all states have a state NFIP Coordinating Agency. **The Maine Floodplain Management Program** is the agency designated by Maine's Governor as the State Coordinating Agency for the National Flood Insurance Program. Here the MFMP supports the agency's role in providing planning assistance to communities. As the State Coordinating Agency, MFMP assists towns with meeting the standards to join the federal flood insurance program. The Program had been housed at the State Planning Office since 1995. In 2012 it moved to the Department of Agriculture, Conservation and Forestry. Two full time positions are currently provided to carry out the responsibilities of floodplain management for the state.

- (1) State Coordinator/Senior Planner
- (1) Planner II
- Shared Clerical and Administrative Support

Description

The snapshot of the Maine physical environment:

Size

- 33,215 square miles (Maine is almost as big as all of the other five New England States put together.)
- 320 miles long and 210 miles wide
- 17,000,000 acres of forests

Communities

- 16 Counties
 - o Aroostook County is 6,453 square miles and covers an area greater than the combined size of Connecticut and Rhode Island.
- 917 communities
 - o 48% of the communities in New England (FEMA's count of 1027 does not match the state numbers but if we use their numbers we have 53%)
 - o 440 Towns
 - o 22 Cities (largest is Portland)
 - o 30 Plantations
 - o 425 Townships
 - o 1,274,923 Population of Maine in 2000
 - 41.3 Persons per square mile

Water features

- 6,079 lakes and ponds
- 31,800 miles of rivers and streams
- 5,000,000 acres of wetlands
- 5,299 miles of coastline - tidal influence (approximately 1/3 of the eastern seaboard. Canada to tip of Florida)
- 4,613 Islands and ledges
- 3,500 miles of saltwater
 - o Mainland - 2,793.3 miles
 - o islands - 2,506.6 miles
- 15 Islands with a year round population
- 2772 square miles of floodplain (larger than the State of Rhode Island)

The snapshot of some of Maine's floodplain management **baselines**:

- 33,000 structures at risk of flooding (approximate based on old FEMA/Donnalay data)

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- 8,234 Flood Insurance Policies in force as of 12/07
- \$1,558,369,000 in Flood Insurance coverage as of 12/07
- 4,113 Claims against the program since 1978 as of 12/07
- 61.5% of the flood insurance policies in effect in Maine are in communities with tidal influence (coastal communities)
- 53.8% of the flood insurance policies in effect in Maine are in communities with coastal Velocity Zones
- The NFIP collects approximately \$5,959,707 annually in flood insurance premiums (12/07)
- 93% of Maine's communities participate in the National Flood Insurance Program.
 - o 83.7% of Maine's municipalities participate in the NFIP
- 21 Maine communities now participate in the Community Rating System (more than any other New England state)
- Over 425 communities are assisted with technical assistance annually
 - o Over 2,225 individually logged assistance contacts annually
- Close to 300 individuals attend Maine Floodplain Management workshops annually
- Handbook updated annually
- Website updated on demand: www.maine.gov/spo/flood/
 - o Web based Best Available Date for Unnumbered A Zones
 - o 5 model Floodplain Management Ordinances (based on level of mapping) maintained on website
 - o Links to important forms and reports and publications
 - o Model permits and decision tree on line
- 2,704 flood map panels in effect
- 19 years is the average age of a Flood Insurance Rate Map in Maine.

With 5,299 miles of coastline in Maine and 2,772 square miles of floodplain, flooding in Maine is inevitable. This flooding, largely the result of coastal storms, heavy spring rains, runoff, and ice jams, has been responsible for millions of dollars of property damage. No private flood insurance is available to insure property against loss from floods; private insurers have found the risk too high. In rare instances some companies will provide flood coverage for mobile homes and for some non-residential use. Those rates are usually very high and not always available.

Assessment of Progress

SPO continues to work with towns one-on-one to update their floodplain ordinances. As part of the MFMP Community Assistance Program Funding with FEMA (CAP/SSSE) it prepares a performance based work plan. Maine's Program has been very effective in accomplishing its goals. Over the years the staff has assisted communities with upgrading their ordinances. By looking at the percent of communities with compliant ordinances, we have gone from only 27 percent with compliant ordinance in 1995 to 77 percent for the last documented federal fiscal year of 2006 that ended on September 30, 2006. Most of those with non compliant ordinances are the towns with 1987 language that does not reflect FEMA/NFIP regulatory changes in 1989 that added definitions for Historic Buildings, Recreational Vehicles, Substantial Damage, and language changes to the definitions of Substantial Improvement and Start of Construction. There have also been numerous changes to the model ordinance language to clarify minor permit development and allow better administration of the ordinance.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

Chapter Summary

Community participation in the National Flood Insurance Program (NFIP) requires the adoption and enforcement of floodplain management measures that are compliant with [Section 60.3](#) of the NFIP regulations. A floodplain management ordinance must meet the requirements of federal and state floodplain management laws. Maine's state Floodplain Management Standards are found in several statutes. In this Chapter we have tried to bring all of the state and federal requirements into one comprehensive model for our towns to use. In Maine the Mandatory Shoreland Zoning Act and Natural Resources Protection Act also play significant roles in managing floodplain development. Maine law dictates the manner by which ordinances are adopted. If your community does not have a building permit system in place, your floodplain ordinance must establish one. It is conceivable that the floodplain regulations can be integrated into the local zoning ordinance.

A. Overview of Participation in the NFIP

The organizational relationships of federal, state, local, and private sectors with regard to the National Flood Insurance Program (NFIP) forms a unique set up of overlapping partnerships. Each group of players is necessary to make the NFIP work.

Local Government

For the purposes of this handbook and the NFIP Local Government is the community. This can include just about any political subdivision other than the state. Towns, cities, counties, and special districts are included in FEMA's definition of local government. In FEMA's regulations, Communities can also mean States and Indian Tribes. But for the purposes of this discussion we are going to use the term community to mean Local Unit of Government.

Federal Government



Information gathered by FEMA preliminary disaster assessment teams may be included in floodplain records as appropriate. This team surveyed damage in Shapleigh, ME, after the spring 2006 floods.

The Federal government provides federally backed flood insurance in exchange for good floodplain management, via an ordinance that regulates all development in the special flood hazard areas of a community. Flood hazard areas are identified on maps that have been developed by the federal government and distributed to states and communities. As discussed in the Introduction to this handbook the National Flood Insurance Act established the National Flood Insurance Program and the Act and subsequent NFIP Regulations at 44 CFR Parts 59 through 78 give us the framework for the Federal, State, and Local requirement to implement and manage the Program. The NFIP is the basic underpinning for what we now call floodplain management in most national floodplain management discussions.

Congress authorizes the [Federal Emergency Management Agency \(FEMA\)](#), through the Federal Insurance Administrator, to identify the flood hazard areas, make maps available, and make (previously unavailable) flood insurance available at reasonable rates. On few occasions, a private insurer has provided flood insurance outside of the NFIP but these ventures have not only been rare but very expensive. One exception is coverage for manufactured housing. Again it is not always available but is on occasion in limited situations.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

Most private sector insurers drop the coverage when it is deemed too costly. Federally backed flood insurance is not available in communities that do not participate in the NFIP. The Federal government will make flood insurance available only in NFIP communities that agree to adopt and enforce an ordinance that meets certain minimum standards.

State Government

The state's primary role in the Program is to provide the authority for communities to adopt the proper ordinances. In the overall organization of the NFIP, FEMA has asked each state to appoint a coordinating agency and coordinating officer. In Maine, the state coordinating agency is the [State Planning Office \(SPO\)](#). The State NFIP Coordinator, also known as the State Floodplain Management Coordinator, and the [Maine Floodplain Management Program](#), are part of, and collocated with, the SPO.

As noted previously in the Introduction, the State's responsibilities are outlined in the NFIP Regulations at [44 CFR §60.25](#).

The Coordinating Agency's role in Maine includes but is not limited to:

- ensuring there is adequate enabling legislation for communities to perform their role
- encourage and assist communities in qualifying for NFIP participation
- encourage and assist communities with joining the Community Rating System
- coordination of Flood Insurance Studies and subsequent mapping
 - o administer Map Modernization
- coordinate local floodplain activities
- technical assistance
- offering workshops and training:
 - o to local officials
 - o to professional groups
 - o to homeowners
 - on how to administer a local floodplain management Program
 - on how to read and use flood maps
 - on assistance with ordinance interpretation,
- assistance with local planning to mitigate flooding hazards,
- providing interagency reviews
 - o for state and federal agencies for compliance with state laws, NFIP, and Governor's executive order
 - o Permit applications and grant proposals for compliance with state and federal floodplain standards, on behalf of other state agencies.
 - o Executive order 11988
- monitoring community Program performance via:
 - o Community Assistance Visits
 - o Community Assistance Contacts
 - o Reviewing Submit for Rate issues

Enabling Legislation

There are several statutory references in Maine that relate to floodplain management and the ability of communities to adopt floodplain management regulations. Below is a listing of most of Maine's laws regarding floodplain management:

5 MRSA § 3305 (A): Directs SPO to coordinate the preparation of policies to guide and carry forward the wise and coordinated development of the State's economy and its energy resources and the conservation of the State's natural resources.

5 MRSA § 3305 (D): Directs SPO to oversee delivery of technical assistance and resources to municipalities for the purpose of floodplain management activities and enhancing and expanding parks, open spaces and recreational opportunities as a part of comprehensive community development.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

38 MRSA § 440: Provides for municipalities to enact zoning and subdivision controls, consistent with comprehensive plans, to avoid problems associated with floodplain development.

37-B MRSA § 1112: Directs the Department of Defense, Veterans and Emergency Management to coordinate with SPO on administering the State's dam safety laws.

Code of Federal Regulations, Title 44, Volume 1, Parts 0 to End, Revised October 1, 1999: Emergency Management and Assistance: Lays out duties and responsibilities of State National Flood Insurance Program Coordinating Agencies that include, among others, assisting communities in qualifying for participation in the Program; assisting public agencies with developing, implementing, and maintaining local floodplain management regulations; providing public information; recommending priorities for Federal floodplain management activities; and assuring coordination and consistency of flood plain management activities among agencies.

Joining the NFIP

Communities can assist its citizens in protecting their property investment from flood losses by joining the National Flood Insurance Program (NFIP). The NFIP is a voluntary federal program that offers homeowners the opportunity to purchase federal flood insurance in communities that meet the necessary standards for participation.

The NFIP is designed as a *quid pro quo* program. The Federal Government underwrites flood insurance in those communities that agree to regulate development in their floodplains. They must adopt and enforce regulations that meet minimum federal standards. The MFMP assists participating towns as well as those interested in joining the NFIP with developing and administering the necessary local floodplain management regulations so that they comply with NFIP. The staff also provides information on the NFIP to homeowners, professionals, businesses, lenders, realtors, and others.

MFMP staff reviews local ordinances for compliance with the NFIP standards. The State, working with FEMA, develops model ordinances for towns to enact as a requirement of participation. The model ordinance is periodically updated and towns are encouraged to adopt revisions so that local standards remain consistent with state and national standards. There is another good reason for towns to comply with NFIP standards: communities that do not update their ordinances run the risk of being suspended and thus losing federal disaster assistance in the event of a Presidential disaster declaration.

Joining the Community Rating System

Assistance is also provided to those communities in the NFIP that seek to lower their flood insurance premiums through the NFIP's Community Rating System (CRS). The Community Rating System is a means of recognizing those communities that exceed minimum standards. The community earns points for different activities designed to reduce flood risk. For each 500 points earned, the flood insurance premiums in the town are reduced by 5%. 21 Maine communities participate in the CRS, more than any other New England state. And Maine homeowners save money from lower premium costs.

Coordination of Flood Insurance Studies and Mapping

Assist in the delineation of riverine and coastal flood-prone areas, whenever possible, and provide all relevant technical information to the Federal Insurance Administrator. With the advent of the Map Modernization Program in 2004 the State developed a business plan laying out it's priorities for what parts of the state should be mapped and in what order. Maine also created a MapMod Program Coordinator position to ensure it was aware of the new mandates and that the state continued to garner its fair share of the Program funding. This plan is continually updated as the federal "metrics" change and the funding fluctuates. Maine was ahead of the curve on Map Mod by doing a map needs assessment in 2002 based on a basin approach. The FEMA national metrics forced Maine to abandon its river basin approach and rethink its priorities based on a county wide mapping mandate.

Coordinate Local Floodplain Activities

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

The state is responsible for recommending priorities for federal floodplain management activities in relation to the needs of the communities within the state. The Coordination Agency is also responsible for notifying the FIA in the event of an apparent irreconcilable difference between a community's local Floodplain Management Regulation and the federal minimum requirements of the NFIP. Our goal is to work with the communities to try to avoid this necessary function. Only when it is clear that a community is refusing or is not responding to all the efforts of communication has the state program found it necessary to contact the FEMA Regional Office.

Technical Assistance

It is also the MFMP's role to provide technical assistance to the communities.

Over the past 10 years, the number of calls for floodplain technical assistance has increased by 85%. In 1999 alone, there was a 23% increase in requests for technical assistance. These requests come from banks, surveyors, towns, code officers, and the public. In the early 1990's the majority of GTA requests came from local officials but as the program has matured and more individuals have become aware of the needs for floodplain management the interest groups have shifted. The breakdown of the assistance offered today is much different but not only in the groups involved but also the complexity of the questions being asked.

The following GTA tally is based on the Coordinator's e-mail and telephone logs in 2006.

▪ Professional Groups	37%
▪ State & Fed. Agencies	28%
▪ Local Officials	25%
▪ Property Owners	10%
Total	100%

Workshops

It is also the state's role to provide training. The MFMP conducts approximately four annual workshops each year for Code Enforcement Officers (CEO) as its part in participating with the Code Enforcement Officer Training and Certification Program. It also does numerous workshops each year for several professional groups including the Maine Professional Land Surveyors (PLS) Association as well as the lending and insurance professionals. Training has been conducted for the majority of other state agencies and in some instances more than one session has been provided such as with the Maine Department of Environment Protection/Land and Water Bureau, State Department of Conservation/Land Use Regulation Commission and Department of Economic and Community Development's office of Community Development. This has led to a better understanding of floodplain management and better compliance with National Flood Insurance Program regulations. In turn, these groups help with community education in their day-to-day work with community and homeowner clients.



MFMP staffer conducting a Code Enforcement Officer's Floodplain Management Workshop at the Augusta Civic Center

Interagency Reviews

The MFMP is also responsible for assuring coordination and consistency of floodplain management activities with other State, area wide and local planning, and enforcement agencies.

Federal Executive Order 11988 requires federally-funded projects to avoid floodplains if practical. Maine has a similar standard contained in a 1968 Executive Order issued by Governor Curtis. The MFMP reviews projects to determine whether they are reasonably safe from flooding and what impact the proposed development may have on surrounding natural resources. Reviews cover state projects as well as state-funded projects in flood areas such as sidewalks, parks, or building rehabilitation that are part of Community Development Block Grant projects; development that needs approval from the Department of Environmental Protection or the Land Use Regulation Commission; snowmobile trails constructed by the Department of Conservation; bridge or road

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

work conducted or funded by the Department of Transportation; and improvements made by the Army Corps of Engineers.

Monitoring Community Program Performance and Progress towards Goals and Objectives

The MFMP conducts a number of Community Assistance Visits (CAVs) and Community Assistance Contacts (CACs) annually to ensure that our cities and towns are having no problems in understanding their ordinances and maps and to provide any needed assistance to help keep in compliance with the state and federal standards.

To achieve its goal of stimulating the development of the State's economy and the conservation of its natural resources, SPO strives to ensure that municipalities have the appropriate building standards in place to reduce losses from flooding. SPO measures its performance by tracking the number of municipalities with up-to-date ordinances.

Meeting Floodplain Management Standards

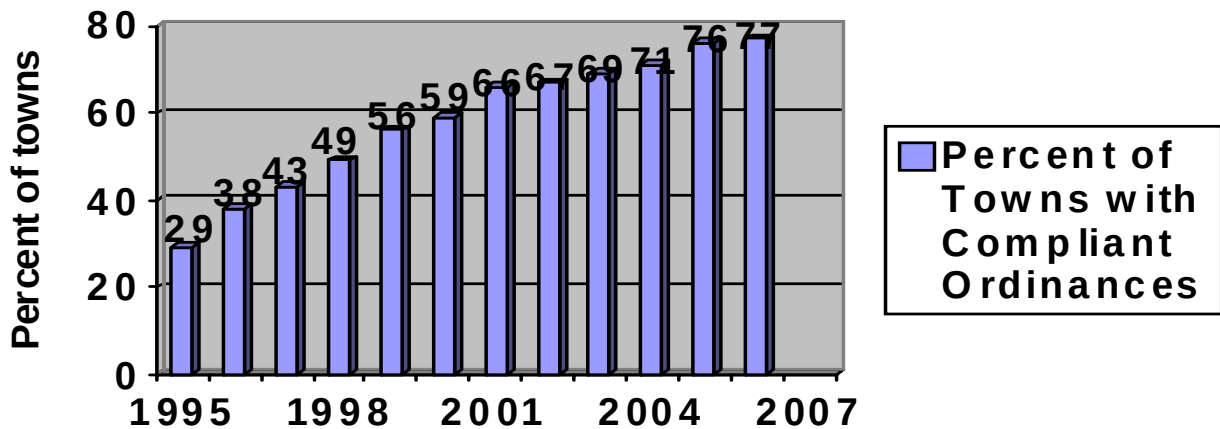


Figure 6: SPO's target is to have all requisite towns update their ordinances

Two additional functions that receive a lot of emphasis are: the Community Assistance Contact (CAC) and the Community Assistance Visit (CAV). Many of Maine's municipalities have been on the receiving end of one or the other, or in some cases both. A visit is exactly what it implies. Someone representing FEMA, usually the state comes to the community and sits down with the local officials and reviews the local floodplain management program as it relates to the NFIP.

The CAV is not intended to be a punitive action, but rather a method of offering assistance and guidance to the participating community if needed. This visit is followed with a report to FEMA and a letter to the community with recommendations or in some cases noting the good job that the community is doing. A CAC is generally a phone call to inquire about the administration and enforcement of the floodplain ordinance and ask if the local officials are having any difficulties. It may result in a follow-up CAV.

The Maine Floodplain Management Program (MFMP) is now averaging over 2,300 calls for assistance per year from communities, citizens, lenders, surveyors, insurance agents, and the public. The Program maintains copies of the ordinance and FIRMs for each community, as well as publications and videos for lending or distributing. The MFMP is available to provide help to any community that needs floodplain management assistance.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

The Community's Role

Because states have empowered communities to regulate land use, and because Congress believed it was more appropriate for development to be regulated at the local level, the NFIP was designed to function as a *Quid Pro Quo* type of program. Congress would underwrite flood insurance and provide the hazard identification (flood maps), the *Quid*, in return for the community's adoption of regulations for development in floodplains, the *Quo*. The literal English translation of the Latin, *Quid Pro Quo*, has been stated as - *This for That*.

The vast majority of communities with floodplain management ordinances have them because they wanted to join the National Flood Insurance Program. In order for your community to participate in the NFIP it must do three things;

- Fill out an application ([see Appendix H](#));
- Adopt a resolution ([see Appendix H](#)); and
- Adopt floodplain regulations that at least meet minimum [NFIP standards](#) (see model ordinance beginning on page 1-12).

The NFIP Application

Each community enters the program on its own volition. [The community's responsibilities are outlined in the [NFIP Regulations](#) at §59.22.]

The NFIP Application asks for the following information about the town. See [Appendix H](#) for a copy of the application.

- Community name
- County and State
- Chief Elected Official
- Address
- Program Coordinator [typically the Code Enforcement Officer]
- Location of repository for public inspection of maps [typically in the town hall in the Code Enforcement Office]
- Estimates of:
 - Community population/floodplain population
 - Number of 1-4 Family structures in community/floodplain
 - Number of small business structures in community/floodplain
 - Number of all other structures in community/floodplain

In reviewing the many applications on file, a common problem is that many of the towns did not provide reasonable estimates when it came to filling in the boxes asking for the number of people and structures in the floodplain. It is very important to provide the best information reasonably possible. While it may not be practical to do an actual count of structures, which some towns have done as part of the comprehensive planning process, it should not be too difficult to establish a reasonable estimate.

The Resolution

The second step the community must accomplish is the adoption of a resolution. For towns with a town meeting form of government, this action must be done at the town meeting. The vast majority of Maine's towns adopted the resolution and joined the Program in the mid 1970's. It is a good idea to go back and look at that resolution to see what promises the town made, and what is still expected of the community today.

The Community also must adopt a Resolution agreeing to:



(Kennebunk, ME) Rescue workers after April 2007 Nor'easter.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

- Adopt and enforce a floodplain management ordinance that meets the minimum standards of the program. [See Section C of this chapter which discusses the floodplain management ordinance.]
- Assist the FIA in delineating the SFHA.
- Maintain for public inspection information needed in determining risk premium rates, i.e. elevation certificates and permit information.
- Cooperate with Federal, State and local agencies and private firms to study, survey, map, and identify high-risk areas and cooperate with neighboring communities to manage adjoining floodplains.
- Notify the FIA of boundary changes or changes in legislative authority.

The required wording of the resolution is fairly specific. A copy of the model Resolution can be found in Appendix H.

Biennial Report

The community has a responsibility to FEMA under 44 CFR 59.22(b)(2) of the federal regulations to submit a Biennial Report to the Federal Insurance Administrator. On the form provided, the community must show the number of permits and variances issued for the prior two years. The community is also asked to update its estimated population and structure figures both in the entire town as well only in the floodplain. Although the population and structure information may not seem important, this information is used nationally to gauge the Program's effectiveness, for example: how many structures are at risk versus how many structures are covered by insurance. These figures also have other program implications as well.

See the sample Biennial Report in [Appendix K](#).

Basis for Regulation

More than 400 communities in Maine, or about 93%, are participating in the NFIP. See the [NFIP Community Status Book](#). They have agreed to adopt and enforce an ordinance regulating floodplain development. It is the ordinance, therefore, which forms the basis for a community's floodplain regulatory program. The Model Ordinance in this manual has been developed for use by Maine municipalities. The ordinance in this manual is different from the one in the last manual. The revision is ongoing, with the Ordinance refined based on community feedback. The Maine FMP will continue to improve the model ordinances based on constructive input so that communities do not experience difficulties administering their own ordinances.

There are now five different model ordinances, depending on the type of maps a community has been given by the Federal Government identifying the hazard, and whether or not the area community is identified as being a coastal community. The model ordinances meet all the minimum requirements of the National Flood Insurance Program (NFIP) regulations (originally published in the Federal Register on October 26, 1976, re-designated as 44 CFR 59-60 May 31, 1979, and revised through November, 1997).

Even if you already have a floodplain ordinance in force, we urge you to read this chapter carefully. References to specific sections in the ordinance are made throughout the manual. The more familiar you are with the ordinance, the better you will understand the regulatory requirements.

B. Ordinance Adoption

State Law Requirements

Title 30-A governs how ordinances are adopted. The normal procedure is delineated in Title 30-A MRSA § 2523. This section requires the proposed ordinance to be attested by the Municipal Clerk as a true copy of the ordinance as certified by the municipal officers and then posted where the municipal warrant is posted at least 7 days prior to the town meeting or city council meeting. In addition, copies of the ordinance must be available at the municipal office at least 14 days before the meeting as well as at the town or city council meeting for examination by interested citizens. The warrant article **must** read: "Shall an ordinance entitled "Floodplain Management Ordinance for the Town/City of _____, Maine _____, 20__" be enacted?" Once enacted, the ordinance shall be on file with the municipal clerk and shall be accessible to any member of the public. Copies shall be available at a reasonable cost.

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If the ordinance is to be voted on by secret ballot then the procedures spelled out in Title 30-A MRSA § 2528, subsection 5 must be adhered to. The statute requires that at least 45 days before the vote the municipal officers must order that the ordinance be voted on secretly. At least 17 days before the vote, the municipal officers must post a public hearing notice in the same manner that a town meeting warrant is posted. Posting shall include a copy of the proposed ordinance, as well as the time and place of the hearing. At least ten days before the vote, the municipal officers must hold a public hearing on the proposed ordinance, and the ordinance language must be available for viewing by the general public. If substantive changes are later made to the ordinance, another hearing must be held prior to the vote.

Repeal of or amendments to an existing ordinance

If the municipality already has a floodplain ordinance or ordinance provisions it proposes to delete, this is most easily accomplished by revising the current ordinance per the sample below:

"This ordinance repeals and replaces any municipal ordinance previously enacted to comply with the National Flood Insurance Act of 1968 (P.L. 90-488, as amended)."

Language to this effect is included as Article XV (Article XIV in the b, c, and d non-coastal models) of the Model Ordinance.

If the municipality proposes to amend an existing ordinance, such as amending the zoning ordinance to include floodplain provisions, then the procedures outlined above for enactment of an ordinance shall be followed exactly, although the ordinance title will be different. In this case, the ordinance should be titled "Floodplain Management Amendments to the Zoning Ordinance of the Town/City of _____, Maine enacted on _____, 20__."

C. Model Ordinance for Municipalities

What follows on the next several pages is one version of the Model Floodplain Management Ordinance. As mentioned above there are five different versions of the model because the NFIP has different requirements for municipalities depending upon their maps and location. Communities whose maps do not show base flood elevations, and who do not have detailed studies, have less detailed ordinances than communities whose maps contain more information. The ordinances are designated as "b" riverine, "b" coastal, "c and d" riverine, "c and d" coastal, and "e" ordinances.

- The "b" ordinances are used by communities which do not have detailed studies or elevations on their maps. The floodplains on those maps are designated only as "A" zones.
- The "c and d" ordinances are used by communities whose maps show floodplain elevations and almost always have detailed studies. Some of those communities also have floodway maps and floodway information in the Flood Insurance Study.
- The "e" ordinance is used by coastal communities whose maps show floodplain elevations and velocity zones (V Zones), and these communities usually have detailed flood studies. Ordinances for coastal communities should consider the special requirements imposed on coastal high hazard areas. Inland communities that experience only riverine flooding are not required to abide by the same regulations.



(Saco, ME) Mitigation measures such as bolting vertical surfaces to the foundation and using hurricane-resistant shingles paid off for owners of this home during 2007 Nor-Easter.

The ordinances are cumulative. In other words, no essential information is changed or deleted as you move from a "b" ordinance to one of the others; just added to.

CHAPTER I – MODEL FLOODPLAIN ORDINANCES

How can I tell which ordinance is right for my town?

The ordinance requirement is determined by the kind of flood hazard identification map that has been provided to your community by the Federal Insurance Administrator. Early maps (before 1979) were created by the Department of Housing and Urban Development (HUD). Maps from 1979 to present were done by the Federal Emergency Management Agency (FEMA).

The more detailed the flood maps that are available to the community, the more detailed the community's floodplain management regulations must be. The National Flood Insurance Program Regulations at 44 CFR, Part 60.3 further tie the type and scope of minimum local regulations to the types of map.

Your community should adopt a 60.3 (b) Floodplain Management Ordinance if the effective Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map for your town meets the following criteria:

- the map is an 11" x 17" "Flat Map" also known as an "Approximate Method Map" without base flood elevations. The Special Flood Hazard Areas (SFHAs) are identified with a capital letter A without any number following the letter (i.e., A Zone);
 - it is a Z-fold map without base flood elevations (**if there are any flood elevations anywhere** on any of the map panels, even though the majority of the zones are A zones then it is **not** a (b) community); or
 - the map is listed in the FEMA Community Status Book as Minimally flood prone (an M is next to the community's map effective date in the Status Book).
-

Your community should adopt a 60.3(c) Floodplain Management Ordinance if the effective Flood Insurance Rate Map for your town:

- is a Z fold map with base flood elevations having Special Flood Hazard Areas identified as an AE, A1-30, AH, and/or AO Zone.
 - **if there are base flood elevations anywhere** on any of the map panels, your community needs this ordinance, even if some panels may not have AE, A1-30, AH or AO and all zones are labeled on the panel as A.
 - has no identified regulatory floodway or coastal high hazard area.
-

Your community should adopt a 60.3(d) Floodplain Management Ordinance if the effective FIRM for your town:

- has any Flood Hazard Areas identified with an AE, A1-A30, AH and/or AO Zone, and
 - has the "floodway" portion of the floodplain delineated on the FIRM with a cross hatched pattern, or
 - for older flood maps such as those dated prior to 1986, has a separate set of Flood Boundary and Floodway Maps delineating the floodway portion of the floodplain as a non-shaded area.
-

Your community should adopt a 60.3(e) Floodplain Management Ordinance if the effective FIRM for your town:

- has any coastal Special Flood Hazard Areas identified as a VE or V1-30 Zone

Community officials should make sure they use the proper model when preparing their own ordinance. Contact the Maine Floodplain Management Program at the State Planning Office if you need assistance in determining which ordinance is required for your community. The models are written for municipalities with a town meeting form of government, but can be adapted for cities or towns with a council form of government by substituting the appropriate language.

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The ordinance is comprised of fifteen articles and it assumes a building permit system does not already exist in the community. If your community has a building permit system in effect, and if the preference is not to have two separate permit systems, the model ordinance can be adapted to fit into the original, permit-establishing ordinance.

For the sake of practicality, we have chosen the "e" ordinance, which is the most detailed, to use as an example in this chapter. The ordinance, as presented in this handbook, is accompanied by commentary explaining the provisions and referencing federal and state regulations. The commentary also describes how to fill in the blanks, and points out those portions of the coastal model which are not applicable to inland communities. The text of the ordinance appears on the left side of the page, and the commentary is on the right side.

The Maine Floodplain Management Program in the State Planning Office maintains five different versions of the model ordinance and can provide a customized copy for your community, upon request. Assistance in modifying the model ordinance to suit your community is available from your regional council or the Maine Floodplain Management Program. Staff is also available if your community needs help in determining the appropriate terminology to fill in the blanks appropriately for your community. The ordinance should be reviewed by the City or Town Attorney prior to adoption since the attorney is the person responsible for defending any challenges to it.

If your community makes changes to the model ordinance, it is imperative that revisions be reviewed by the Maine Floodplain Management staff or FEMA prior to adoption. There have been Maine communities that have spent a tremendous amount of time and resources to develop their own ordinance, only to find out after it was adopted that it did not meet the minimum NFIP requirements. A community could be subject to suspension from the NFIP if lesser standards are adopted. If you have any questions, please contact the staff of the Maine Floodplain Management Program, your regional council, or FEMA, all of whom are available to provide assistance to community officials.

The model Floodplain Management Ordinances are also available on the SPO web site at: <http://www.Maine.gov/spo/flood>. Under the "floodplain management" heading, choose "ordinances and permit forms".

Carefully follow the instructions for choosing the appropriate ordinance.

FLOODPLAIN MANAGEMENT ORDINANCE

FOR THE

TOWN/CITY OF _____, MAINE

ENACTED:

Date

CERTIFIED BY:

Name

Title

Affix Seal

ARTICLE I – PURPOSE AND ESTABLISHMENT

Certain areas of the (Town/City) of _____, Maine are subject to periodic flooding, causing serious damages to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968.

Therefore, the (Town/City) of _____, Maine has chosen to become a participating community in the National Flood Insurance Program, and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended) as delineated in this Floodplain Management Ordinance.

It is the intent of the (Town/City) of _____, Maine to require the recognition and evaluation of flood hazards in all official actions relating to land use in the floodplain areas having special flood hazards.

The (Town/City) of _____ has the legal authority to adopt land use and control measures to reduce future flood losses pursuant to Title 30-A MRSA, Sections 3001-3007, 4352, 4401-4407, and Title 38 MRSA, Section 440.

The National Flood Insurance Program, established in the aforesaid Act, provides that areas of the (Town/City) of _____ having a special flood hazard be identified by the Federal Emergency Management Agency and that floodplain management measures be applied in such flood hazard areas. This Ordinance establishes a Flood Hazard Development Permit system and review procedure for development activities in the designated flood hazard areas of the (Town/City) of _____, Maine.

The areas of special flood hazard, Zones A, A1-30, AE, AO, AH, V1-30, and/or VE, are identified by the Federal Emergency Management Agency in a report entitled "Flood Insurance Study - (Town/City) of _____, Maine, _____ County," dated _____ with accompanying "Flood Insurance Rate Map" dated _____ with panels: (list panel numbers with suffix) derived from the county wide digital Flood Insurance Rate Map entitled "Digital Flood Insurance Rate Map, _____ County," are hereby adopted by reference and declared to be a part of this Ordinance.

ARTICLE II - PERMIT REQUIRED

Before any construction or other development (as defined in Article XIV), including the placement of manufactured homes, begins within any areas of special flood hazard established in Article I, a Flood Hazard Development Permit shall be obtained from the _____ except as provided in Article VII. This permit shall be in addition to any other permits which may be required pursuant to the codes and ordinances of the (Town/City) of _____, Maine.

COMMENTARY

The first four paragraphs were added to Article I in 1996. These paragraphs were formerly in the Statement of Purpose and Intent. These paragraphs clarify the purpose of the community's participation in the National Flood Insurance Program.

This article establishes the purposes of the ordinance and references the federal statutes and programs.

The last paragraph references the Flood Insurance Study (FIS) and/or Flood Insurance Rate Maps (FIRMs) that have been prepared for the community. It incorporates these documents as part of the ordinance. If your community is not a coastal community, your ordinance should not include reference to zones V1-30 or VE. Communities with FIRM maps after 1986 will not have A1-30 Zones. Likewise, communities with older FIRMs will not have AE Zones. AO and AH are typically coastal flooding zones. If a detailed study has not been done for your community, your ordinance should only refer to Zone A and will not reference a FIS, only the FIRM.

Sometimes, a community may have a FIRM that includes Base Flood Elevations (BFEs) derived from a FIS done for an adjoining community. This may occur when two or more communities share a water body.

Article II establishes the requirement for a permit prior to development within the floodplain. The key word here is "development." The NFIP defines development more broadly than do most communities for regulatory purposes.

The blank here identifies the official administering the ordinance, usually the Code Enforcement Officer (CEO) or Planning Board (PB).

ARTICLE III - APPLICATION FOR PERMIT

The application for a Flood Hazard Development Permit shall be submitted to the _____ and shall include:

- A. The name, address, and phone number of the applicant, owner, and contractor;
- B. An address and a map indicating the location of the construction site;
- C. A site plan showing location of existing and/or proposed development, including but not limited to structures, sewage disposal facilities, water supply facilities, areas to be cut and filled, and lot dimensions;
- D. A statement of the intended use of the structure and/or development;
- E. A statement of the cost of the development including all materials and labor;
- F. A statement as to the type of sewage system proposed;
- G. Specification of dimensions of the proposed structure and/or development;

[Items H-K.3. apply only to new construction and substantial improvements.]

- H. The elevation in relation to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD), or to a locally established datum in Zone A only, of the:
 - 1. base flood at the proposed site of all new or substantially improved structures, which is determined:
 - a. in Zones A1-30, AE, AO, AH, V1-30, and VE from data contained in the "Flood Insurance Study - (Town/City) of _____, Maine," as described in Article I; or,
 - b. in Zone A:
 - (1) from any base flood elevation data from federal, state, or other technical sources (such as FEMA's Quick-2 model, FEMA 265), including information obtained pursuant to Article VI.K. and IX.D.; or,

The blank here needs to identify the local official responsible for accepting the permit application, usually the CEO or PB.

The Maine Floodplain Management Program (MFMP) has a state model application and permit package that the community may use as is or in developing their own permitting forms.

The questions asked in Article III (and the information requested on the model application and permit forms) are required for the CEO or PB to properly administer the community's ordinances in order to meet the minimum standards of NFIP.

NGVD or NAVD should be used, even in Zone A, when feasible. The datum on the community's FIRM must be the datum used for permitting purposes. Elevations should be certified by an architect, professional engineer or professional land surveyor, and submitted with the permit application. As communities are provided digital maps, the datum will change to North American Vertical Datum 1988 (NAVD). NGVD or NAVD should not be confused with mean high or mean low water.

If a community has not undergone a detailed study, the reference will only be made to Zone A. Communities without velocity zones should not reference zones V1-30 or VE.

[FEMA's Quick-2](#) program can be used to calculate BFEs in open flow channels. Quick-2 will provide flood depth and the elevation in NGVD or NAVD. That conversion must be done separately.

MAINE MODEL FLOODPLAIN MANAGEMENT ORDINANCE WITH COMMENTARY

- (2) in the absence of all data described in Article III.H.1.b.(1), information to demonstrate that the structure shall meet the elevation requirement in Article VI.F.4.b., Article VI.G.4.b., or Article VI.H.4.b.
2. highest and lowest grades at the site adjacent to the walls of the proposed building;
3. lowest floor, including basement; and whether or not such structures contain a basement; and,
4. level, in the case of non-residential structures only, to which the structure will be floodproofed;
- I. A description of an elevation reference point established on the site of all developments for which elevation standards apply as required in Article VI;
- J. A written certification by a Professional Land Surveyor, registered professional engineer or architect, that the base flood elevation and grade elevations shown on the application are accurate;
- K. The following certifications as required in Article VI by a registered professional engineer or architect:
1. a Floodproofing Certificate (FEMA Form 81-65, as amended), to verify that the floodproofing methods for any non-residential structures will meet the floodproofing criteria of Article VI.G.; and other applicable standards in Article VI;
 2. a V-Zone Certificate to verify that the construction in coastal high hazard areas, Zones V1-30, VE, and Coastal AE Zone, will meet the criteria of Article VI.P.; and other applicable standards in Article VI;
 3. a Hydraulic Openings Certificate to verify that engineered hydraulic openings in foundation walls will meet the standards of Article VI.L.2.a.;
 4. a certified statement that bridges will meet the standards of Article VI.M.;
 5. a certified statement that containment walls will meet the standards of Article VI.N.
- If there is no base flood elevation information available from any existing source, the applicant can either: (1) choose to build so that the top of the lowest floor is elevated two feet above the highest adjacent grade to the outside of the building, or (2) hire a professional engineer to calculate the base flood elevation. This language was added to the model ordinance in 2017 to clarify the requirement that basements or crawlspaces should not be sunk underground in Zone A. Any "walk out" area in Zone A (that has one side at grade), should have hydraulic openings (i.e., flood vents). Unlike flood zones that have a BFE, flood insurance in Zone A is rated on the differential between the highest adjacent grade and the lowest floor of the building. The lower the floor is below the highest adjacent grade, the more expensive flood insurance will be.*
- A PLS or PE needs to establish a reference mark (RM) or Temporary Bench Mark (TMB) on site for convenient referencing by the applicant and the CEO during planning and construction.*
- Elevations should be certified by an architect, professional engineer or professional land surveyor, and submitted with the permit application. They do not need to be on an Elevation Certificate.*
- Non-residential structures can be dry floodproofed in lieu of elevating. An architect or PE must certify that the building design meets this standard.*
- Inland communities or communities without velocity zones will not have this language in the ordinance.*
- There is a model V-Zone Certificate included in the state application and permit forms.*
- For further guidance, see [FEMA Technical Bulletin 1, Openings in Foundation Walls](#).*
- There is a model Hydraulic Openings Certificate included in the state application and permit forms. This certificate is not required if designing openings to the minimum standard as outlined in Article VI.L.2.b.*

MAINE MODEL FLOODPLAIN MANAGEMENT ORDINANCE WITH COMMENTARY

- L. A description of the extent to which any water course will be altered or relocated as a result of the proposed development; and,
- M. A statement of construction plans describing in detail how each applicable development standard in Article VI will be met.

Altered or relocated watercourses usually require other Federal and State permits (USACE and DEP) before a local permit is issued. The community has notification responsibilities under Article V.E. and other responsibilities under 44 CFR 65.3 since altering or relocating a watercourse will trigger the need for a Letter of Map Revision (LOMR).

ARTICLE IV - APPLICATION FEE AND EXPERT'S FEE

A non-refundable application fee of \$ _____ for all minor development and \$ _____ for all new construction or substantial improvements shall be paid to the (Town/City) Clerk or Code Enforcement Officer and a copy of a receipt for the same shall accompany the application.

An additional fee may be charged if the Code Enforcement Officer, Planning Board, and/or Board of Appeals needs the assistance of a professional engineer or other expert. The expert's fee shall be paid in full by the applicant within 10 days after the town submits a bill to the applicant. Failure to pay the bill shall constitute a violation of the ordinance and be grounds for the issuance of a stop work order. An expert shall not be hired by the municipality at the expense of an applicant until the applicant has either consented to such hiring in writing or been given an opportunity to be heard on the subject. An applicant who is dissatisfied with a decision to hire expert assistance may appeal that decision to the Board of Appeals.

The MFMP suggests that communities charge a fee to help offset the costs of administering the ordinance. Many communities charge a split fee of \$25 for minor permits and \$50 for new construction or substantial improvement. Alternative fee options are available for consideration.

This paragraph allows the community to collect an additional fee for applications of greater technical difficulty to allow the community to hire the necessary technical assistance. This allows for additional information or clarification on issues needing expert review.

ARTICLE V - REVIEW STANDARDS FOR FLOOD HAZARD DEVELOPMENT PERMIT APPLICATIONS

The _____ shall:

- A. Review all applications for the Flood Hazard Development Permit to assure that proposed developments are reasonably safe from flooding and to determine that all pertinent requirements of Article VI (Development Standards) have been, or will be met;
- B. Utilize, in the review of all Flood Hazard Development Permit applications:
 - 1. the base flood and floodway data contained in the "Flood Insurance Study - (Town/City) of _____, Maine," as described in Article I.;
 - 2. in special flood hazard areas where base flood elevation and floodway data are not provided, the _____ shall obtain,

This blank must identify the official administering the ordinance, usually the CEO or PB. The MFMP recommends the CEO due to available training and certification requirements for CEOs.

Required by NFIP: 44 CFR 60.3(a)(3)

*Again, Identify the official administering the ordinance.
Required by NFIP: 44 CFR 60.3(b)(4)*

MAINE MODEL FLOODPLAIN MANAGEMENT ORDINANCE WITH COMMENTARY

review and reasonably utilize any base flood elevation and floodway data from federal, state, or other technical sources, including information obtained pursuant to Article III.H.1.b.(1); Article VI.K.; and Article IX.D., in order to administer Article VI of this Ordinance; and,

3. when the community establishes a base flood elevation in a Zone A by methods outlined in Article III.H.1.b.(1), the community shall submit that data to the Maine Floodplain Management Program.

- C. Make interpretations of the location of boundaries of special flood hazard areas shown on the maps described in Article I of this Ordinance;

Required by NFIP: 44 CFR 60.3(a)(3) and 44 CFR 59.22(a)(8)

- D. In the review of Flood Hazard Development Permit applications, determine that all necessary permits have been obtained from those federal, state, and local government agencies from which prior approval is required by federal or state law, including but not limited to Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1344;

Required by NFIP: 44 CFR 60.3(a)(2)
Federal regulations cited above require that all other permits must have been issued and be in hand prior to the issuance of the Flood Hazard Development Permit. The Flood Hazard Development Permit is the last permit to be issued in the chain of permits.

- E. Notify adjacent municipalities, the Department of Environmental Protection, and the Maine Floodplain Management Program prior to any alteration or relocation of a water course and submit copies of such notifications to the Federal Emergency Management Agency;

Required by NFIP: 44 CFR 60.3(b)(6)
Alteration or relocation of a waterway requires a Letter of Map Revision (LOMR) as provided in 44 CFR 65.

- F. If the application satisfies the requirements of this Ordinance, approve the issuance of one of the following Flood Hazard Development Permits, based on the type of development:

Required by NFIP: 44 CFR 60.3(b)(1)

The Decision Tree located in the state model application and permit package may be helpful in determining which type of permit to issue.

1. A two-part Flood Hazard Development Permit for elevated structures. Part I shall authorize the applicant to build a structure to and including the first horizontal floor only above the base flood level. At that time the applicant shall provide the Code Enforcement Officer with an "under construction" Elevation Certificate completed by a Professional Land Surveyor, registered professional engineer or architect based on the Part I permit construction, for verifying compliance with the elevation requirements of Article VI, paragraphs F., G., H., or P. Following review of the Elevation Certificate data, which shall take place within 72 hours of receipt of the application, the Code Enforcement Officer shall issue Part II of

A two-part permit system is not required by the NFIP but is strongly recommended by the MFMP and is incorporated into the model ordinance. It is much easier to correct a problem of lowest floor elevation before the structure is completed.

The Model FMO requires the use of the Elevation Certificate. Credit is given under the Community Rating System (CRS) for using the FEMA Elevation Certificate.

Please use the most current Elevation Certificate available. FEMA may not accept outdated forms for insurance purposes or Letter of Map Corrections. At least 2 photos are also required showing the front and the back of the building.

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the Flood Hazard Development Permit. Part II shall authorize the applicant to complete the construction project; or,

2. A Flood Hazard Development Permit for Floodproofing of Non-Residential Structures that are new construction or substantially improved non-residential structures that are not being elevated but that meet the floodproofing standards of Article VI.G.1.a.,b., and c. The application for this permit shall include a Floodproofing Certificate signed by a registered professional engineer or architect; or,
3. A Flood Hazard Development Permit for Minor Development for all development that is not new construction or a substantial improvement, such as repairs, maintenance, renovations, or additions, whose value is less than 50% of the market value of the structure. Minor development also includes, but is not limited to: accessory structures as provided for in Article VI.J., mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; and non-structural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.

For development that requires review and approval as a Conditional Use, as provided for in this Ordinance, the Flood Hazard Development Permit Application shall be acted upon by the Planning Board as required in Article VII.

Conditional Use Permits are not part of the NFIP requirements but have been approved for use in Maine by FEMA as specified in this ordinance.

- G. Maintain, as a permanent record, copies of all Flood Hazard Development Permit Applications, corresponding Permits issued, and data relevant thereto, including reports of the Board of Appeals on variances granted under the provisions of Article X of this Ordinance, and copies of Elevation Certificates, Floodproofing Certificates, Certificates of Compliance and certifications of design standards required under the provisions of Articles III, VI, and VIII of this Ordinance.

Required by NFIP: 44 CFR 59.22(a)(9)(iii), 44 CFR 60.3(b)(5)(iii), 44 CFR 60.3(c)(4)(ii), and 44 CFR 60.6(a)(5) and (6)

Elevation certificates are necessary for documentation of building compliance and insurance rating for post-FIRM buildings or buildings that have been substantially improved.

ARTICLE VI - DEVELOPMENT STANDARDS

All developments in areas of special flood hazard shall meet the following applicable standards:

- A. **All Development** All development shall:

Required by NFIP: 44 CFR 60.3(a)(3)(ii)

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1. be designed or modified and adequately anchored to prevent flotation (excluding piers and docks), collapse or lateral movement of the development resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
2. use construction materials that are resistant to flood damage;
3. use construction methods and practices that will minimize flood damage; and,
4. use electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities that are designed and/or located to prevent water from entering or accumulating within the components during flooding conditions.

Development that is not anchored may become part of the debris generated by a flood event. Debris can cause damage to other structures and additional flooding when it comes to a narrow restriction like a bridge or culvert.

Required by NFIP: 44 CFR 60.3(a)(3)(ii) Flood-resistant materials are required below the base flood elevation. For further guidance, see FEMA Technical Bulletin, TB 2, [Flood Damage Resistant Materials Requirements](#).

Required by NFIP: 44 CFR 60.3(a)(3)(iii)

Required by NFIP: 44 CFR 60.3(a)(3)(iv) Paying for the replacement and repair of furnaces is one of the larger expenses incurred under the NFIP following a flood event.

- B. **Water Supply** - All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems.

Required by NFIP: 44 CFR 60.3(a)(5)

To meet the standards of Article VI paragraphs B., C., and D., permit officials should have verification from design professionals that the specific flooding risks at the site were taken into account when designing the system.

- C. **Sanitary Sewage Systems** - All new and replacement sanitary sewage systems shall be designed and located to minimize or eliminate infiltration of flood waters into the system and discharges from the system into flood waters.

Required by NFIP: 44 CFR 60.3(a)(6)(i)

- D. **On Site Waste Disposal Systems** – On-site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during floods.

Required by NFIP: 44 CFR 60.3(a)(6)(ii)

- E. **Watercourse Carrying Capacity** - All development associated with altered or relocated portions of a watercourse shall be constructed and maintained in such a manner that no reduction occurs in the flood carrying capacity of the watercourse.

Required by NFIP: 44 CFR 60.3(b)(7) Changes to a water course will bring 44 CFR 65 into play (LOMR).

- F. **Residential** - New construction or substantial improvement of any residential structure located within:

1. Zones A1-30, AE, AO, and AH shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation.
2. Zones AO and AH shall have adequate

Required by NFIP: 44 CFR 60.3(c)(2) The NFIP requires structures to be at or above the BFE. Maine standards require a one foot freeboard. Some Maine communities have chosen to require a freeboard of two or more feet. Shoreland Zoning requires a one foot freeboard.

Required by NFIP: 44 CFR 60.3(c)(11)

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drainage paths around structures on slopes, to guide floodwater away from the proposed structures.

Communities without detailed studies would include only Zone A, paragraph 1, but not include paragraphs F.2., F.3., and F.5.

Most AO and AH zones occur in coastal communities.

3. Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:

Required by NFIP: 44 CFR 60.3(c)(7)

The NFIP requires elevation to the depth specified. Maine requires that one-foot freeboard be added. A community may be more restrictive and add additional freeboard.

- a. at least one foot higher than the depth specified in feet on the community's Flood Insurance Rate Map; or,

Two feet is required by NFIP: 44 CFR 60.3(c)(7)

- b. at least three feet if no depth number is specified.

4. Zone A shall have the lowest floor (including basement) elevated:

Required by NFIP: 44 CFR 60.3(b)(4)

The NFIP requires structures to be at or above the BFE. The Maine standards require that communities adopt a freeboard of one foot.

- a. to at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1.b.(1); Article V.B.; or Article IX.D., or;

The applicant can choose to build with the lowest floor two feet above the highest adjacent grade to the building or they can hire an engineer to calculate the BFE.

- b. in the absence of all data described in Article VI.F.4.a., to at least two feet above the highest adjacent grade to the structure.

Inland communities or communities without velocity zones should not include this paragraph.

5. Zone V1-30, VE and Coastal AE Zone (as defined) shall meet the requirements of Article VI.P.

G. **Non-Residential** - New construction or substantial improvement of any non-residential structure located within:

1. Zones A1-30, AE, AO, and AH shall have the lowest floor (including basement) elevated to at least one foot above the base flood elevation, or together with attendant utility and sanitary facilities shall:

Required by NFIP: 44 CFR 60.3(c)(3)

- a. be floodproofed to at least one foot above the base flood elevation so that below that elevation the structure is watertight with walls substantially impermeable to the passage of water;

The Maine standards require that communities adopt a one-foot freeboard.

- b. have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and,

- c. be certified by a registered professional engineer or architect that the floodproofing design and methods of

Required by NFIP: 44 CFR 60.3(c)(4)

Most floodproofing is appropriate only where

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construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a Flood Hazard Development Permit, as required by Article III.K. and shall include a record of the elevation above mean sea level to which the structure is floodproofed.

floodwaters are less than three feet deep, since walls and floors may collapse under higher water levels. It is relatively expensive and difficult to overcome the buoyancy issues.

2. Zones AO and AH shall have adequate drainage paths around structures on slopes, to guide floodwater away from the proposed structures.

Required by NFIP: 44 CFR 60.3 (c)(11)

3. Zone AO shall have the lowest floor (including basement) elevated above the highest adjacent grade:

Required by NFIP: 44 CFR 60.3 (c)(8)

- a. at least one foot higher than the depth specified in feet on the community's Flood Insurance Rate Map; or,
- b. at least three feet if no depth number is specified; or,
- c. together with attendant utility and sanitary facilities be floodproofed to meet the elevation requirements of this section and floodproofing standards of Article VI.G.1.a., b., and c.

NFIP requires elevation to the depth specified. Maine requires a one foot freeboard be added. A community may be more restrictive and add additional freeboard.

The NFIP only requires two feet. Maine recommends three feet.

Furnaces, air conditioners, and other related pertinent equipment must be elevated above the base flood elevation.

4. Zone A shall have the lowest floor (including basement) elevated:

Required by NFIP: 44 CFR 60.3(b)(4)

- a. to at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1. b.(1); Article V.B.; or Article IX.D., or;
- b. in the absence of all data described in Article VI.G.4.a., to at least two feet above the highest adjacent grade to the structure; or,
- c. together with attendant utility and sanitary facilities, be floodproofed to one foot above the elevation established in Article VI.G.4.a. or b., and meet the floodproofing standards of Article VI.G.1.a., b., and c.

The Maine standards require that a community adopt a freeboard of one foot.

The applicant can choose to build with the lowest floor two feet above the highest adjacent grade to the building or they can hire an engineer to calculate the BFE.

5. Zone V1-30, VE and Coastal AE Zone (as defined) shall meet the requirements of Article VI.P.

Inland communities or communities without velocity zones should not include this paragraph.

- H. **Manufactured Homes** - New or substantially

Required by NFIP: 44 CFR 60.3(c)(6)

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improved manufactured homes located within:

1. Zones A1-30, AE, AO, and AH shall:

- a. be elevated such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation;
- b. be on a permanent foundation, which may be poured masonry slab or foundation walls, with hydraulic openings, or may be reinforced piers or block supports, any of which support the manufactured home so that no weight is supported by its wheels and axles; and,
- c. be securely anchored to an adequately anchored foundation system to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to:
 - (1) over-the-top ties anchored to the ground at the four corners of the manufactured home, plus two additional ties per side at intermediate points (manufactured homes less than 50 feet long require one additional tie per side); or by,
 - (2) frame ties at each corner of the home, plus five additional ties along each side at intermediate points (manufactured homes less than 50 feet long require four additional ties per side).
 - (3) all components of the anchoring system described in Article VI.H.1.c.(1) & (2) shall be capable of carrying a force of 4800 pounds.

2. Zones AO and AH shall have adequate drainage paths around structures on slopes, to guide floodwater away from the proposed structures.

3. Zone AO shall have the lowest floor (including basement) of the manufactured home elevated above the highest adjacent grade:

- a. at least one foot higher than the depth specified in feet on the community's

Most AO and AH zones occur in coastal communities.

Communities without detailed studies would only reflect Zone A under H.1. and should not include paragraphs H.2., H.3., and H.5.

See also: [FEMA P-85, Protecting Manufactured Homes from Floods and Other Hazards](#).

Maine standards require a one-foot freeboard.

The permanent foundation requirement is found in the [Flood Insurance Manual, General Rules](#). In order for a manufactured home to be insurable under the NFIP, it must be elevated, affixed to a permanent foundation, and be adequately anchored in accordance with manufacturer's specifications or be in compliance with the community's floodplain management ordinance.

Required by NFIP: 44 CFR 60.3(b)(8) and (c)(6)

Required by NFIP: 44 CFR 60.3(c)(11)

The NFIP only requires two feet. Maine recommends three feet.

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Flood Insurance Rate Map; or,

- b. at least three feet if no depth number is specified; and,
- c. meet the anchoring requirements of Article VI.H.1.c.

4. Zone A shall:

- a. be elevated on a permanent foundation, as described in Article VI.H.1.b., such that the lowest floor (including basement) of the manufactured home is at least one foot above the base flood elevation utilizing information obtained pursuant to Article III.H.1.b.(1); Article V.B.; or Article IX.D.; or,
- b. in the absence of all data described in Article VI.H.4.a., to at least two feet above the highest adjacent grade to the structure; and,
- c. meet the anchoring requirements of Article VI.H.1.c.

Required by NFIP: 44 CFR 60.3(b)(4) and (b)(8)

Communities without detailed studies should modify this paragraph to include the standards in Article VI.H.1.

The applicant can choose to build with the lowest floor two feet above the highest adjacent grade to the building or they can hire an engineer to calculate the BFE.

5. Zones V1-30, VE, and Coastal AE Zone (as defined) shall meet the requirements of Article VI.P.

Inland communities or communities without Velocity Zones should not include this paragraph.

I. **Recreational Vehicles** - Recreational Vehicles located within:

Required by NFIP: 44 CFR 60.3(c)(14)

1. Zones A, A1-30, AE, AO, and AH shall either:

- a. be on the site for fewer than 180 consecutive days; and,
- b. be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or,
- c. be permitted in accordance with the elevation and anchoring requirements for "manufactured homes" in Article VI.H.1.

2. Zones V1-30, VE, and Coastal AE Zone (as defined) shall meet the requirements of either Article VI.I.1.a. and b., or Article VI.P.

Required by NFIP: 44 CFR 60.3(e)(9)

Inland communities or communities without Velocity Zones should not include this paragraph.

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J. **Accessory Structures** - Accessory Structures, as defined in Article XIV, located within Zones A1-30, AE, AO, AH, and A, shall be exempt from the elevation criteria required in Article VI.F. & G. above, if all other requirements of Article VI and all the following requirements are met. Accessory Structures shall:

1. have unfinished interiors and not be used for human habitation;
2. have hydraulic openings, as specified in Article VI.L.2., in at least two different walls of the accessory structure;
3. be located outside the floodway;
4. when possible be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters and be placed further from the source of flooding than is the primary structure;
5. have only ground fault interrupt electrical outlets. The electric service disconnect shall be located above the base flood elevation and when possible outside the Special Flood Hazard Area; and,
6. be located outside the Coastal AE Zone.

K. **Floodways** -

1. In Zones A1-30 and AE riverine areas, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted within a regulatory floodway which is designated on the community's "Flood Insurance Rate Map" or "Flood Boundary and Floodway Map," unless a technical evaluation certified by a registered professional engineer is provided demonstrating that such encroachments will not result in any increase in flood levels within the community during the occurrence of the base flood discharge.
2. In Zones A1-30, AE, and A riverine areas, for which no regulatory floodway is designated, encroachments, including fill, new construction, substantial improvement, and other development shall not be permitted in the floodway as determined in Article VI.K.3. unless a technical evaluation certified by a registered professional engineer is provided demonstrating that the

Accessory structures are not specifically addressed in the NFIP regulations. The standards for accessory structures have been developed by the State of Maine based on guidance from FEMA.

Required by NFIP: 44 CFR 60.3(d)(3)

Communities without detailed studies/base flood elevations should not include this paragraph.

Required by NFIP: 44 CFR 60.3(c)(10)

cumulative effect of the proposed development, when combined with all other existing development and anticipated development:

- a. will not increase the water surface elevation of the base flood more than one foot at any point within the community; and,
- b. is consistent with the technical criteria contained in [FEMAs guidelines and standards for flood risk analysis and mapping](#).

3. In Zones A1-30, AE, and A riverine areas for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain as measured from the normal high water mark to the upland limit of the floodplain.

This paragraph exceeds the minimum NFIP standards for floodways that have not been designated on the FIRM. The State of Maine chose to regulate on the conservative end of the scale. If an applicant wishes to hire an engineer to determine the actual floodway width, it is recommended that the engineer's determination be followed.

- L. **Enclosed Areas Below the Lowest Floor-**
New construction or substantial improvement of any structure in Zones A1-30, AE, AO, AH, and A that meets the development standards of Article VI, including the elevation requirements of Article VI, paragraphs F., G., or H. and is elevated on posts, columns, piers, piles, or crawl spaces may be enclosed below the base flood elevation requirements provided all the following criteria are met or exceeded:

Required by NFIP: 44 CFR 60.3(c)(5)

Communities without detailed studies should only reference Zone A in this subsection.

1. Enclosed areas are not "basements" as defined in Article XIV;
2. Enclosed areas shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood water. Designs for meeting this requirement must either:
 - a. be engineered and certified by a registered professional engineer or architect; or,
 - b. meet or exceed the following minimum criteria:
 - (1) a minimum of two openings having a total net area of not less than one square inch for every square foot of the enclosed area;
 - (2) the bottom of all openings shall be below the base flood elevation

Under the NFIP, a "basement" is defined as being below grade on all four sides.

See [FEMA Technical Bulletin, TB 1, Openings in Foundation Walls](#).

It is recommended that the two openings be in two different walls.

This is more restrictive than the federal regulations at 60.3(c)(5).

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and no higher than one foot above the lowest grade; and,

- (3) openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the entry and exit of flood waters automatically without any external influence or control such as human intervention, including the use of electrical and other non-automatic mechanical means;

Required by NFIP: 44 CFR 60.3(c)(5)

3. The enclosed area shall not be used for human habitation; and,
4. The enclosed areas are usable solely for building access, parking of vehicles, or storage.

The limited uses permitted in paragraph 4 preclude human habitation, utilities, machinery, and equipment.

- M. **Bridges** - New construction or substantial improvement of any bridge in Zones A1-30, AE, AO, AH, A, V1-30 and VE shall be designed such that:

NFIP does not specify elevation requirements for bridges. Maine chose to be more restrictive in an effort to mitigate the potential for damage to bridges and to minimize obstructions to flow during a base flood event.

1. when possible, the lowest horizontal member (excluding the pilings, or columns) is elevated to at least one foot above the base flood elevation; and,
2. a registered professional engineer shall certify that:
 - a. the structural design and methods of construction shall meet the elevation requirements of this section and the floodway standards of Article VI.K.; and,
 - b. the foundation and superstructure attached thereto are designed to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all structural components. Water loading values used shall be those associated with the base flood.

- N. **Containment Walls** - New construction or substantial improvement of any containment wall located within:

NFIP does not contain development standards for containment walls. The State of Maine chose to be more restrictive to avoid contamination from or to flood water.

1. Zones A, A1-30, AE, AO, AH, V1-30 and VE shall:
 - a. have the containment wall elevated to at least one foot above the base flood elevation;

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- b. have structural components capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy; and,
 - c. be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this section. Such certification shall be provided with the application for a Flood Hazard Development Permit, as required by Article III.K.
- 2. Zones AO and AH shall have adequate drainage paths around containment walls on slopes, to guide floodwater away from the proposed walls.
 - 3. Zone AO shall have the top of the containment wall elevated above the highest adjacent grade:
 - a. at least one foot higher than the depth specified in feet on the community's Flood Insurance Rate Map; or,
 - b. at least three feet if no depth number is specified; and,
 - c. shall meet the requirements of Article VI.N.1.b. & c.

O. Wharves, Piers and Docks - New construction or substantial improvement of wharves, piers, and docks are permitted in Zones A1-30, AE, AO, AH, A, V1-30, and VE, in and over water and seaward of the mean high tide if the following requirements are met:

- 1. wharves, piers, and docks shall comply with all applicable local, state, and federal regulations; and,
- 2. for commercial wharves, piers, and docks, a registered professional engineer shall develop or review the structural design, specifications, and plans for the construction.

NFIP requires permitting of wharves, piers, and docks as development in the floodplain. The standards in Article VI.A.1.-4. (as applicable) will apply.

Design and construction standards are outlined in the U.S. Army Corps of Engineers (USACE) [Coastal Engineering Manual](#).

P. Coastal Floodplains -

- 1. All new construction located within Zones A1-30, AE, A, V1-30 and VE shall be located landward of the reach of mean high tide except as provided in Article VI.P.6.
- 2. New construction or substantial

Required by NFIP: 44 CFR 60.3(e)(3)

Inland communities or communities without velocity zones should not include this section.

No solid foundation walls are allowed below the base

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improvement of any structure located within Zones V1-30, VE, or Coastal AE Zone (as defined) shall:

a. be elevated on posts or columns such that:

(1) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to one foot above the base flood elevation;

(2) the pile or column foundation and the elevated portion of the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components; and,

(3) water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable state and local building standards.

b. have the space below the lowest floor:

(1) free of obstructions; or,

(2) constructed with open wood lattice-work, or insect screening intended to collapse under wind and water without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting piles or columns; or,

(3) constructed to enclose less than 300 square feet of area with non-supporting breakaway walls that have a design safe loading resistance of not less than 10 or more than 20 pounds per square foot.

[NFIP flood insurance premiums will be higher for breakaway walls that exceed 299 square feet. The larger the square footage of the enclosure, the higher the cost of insurance. Developers are advised to inquire into flood insurance premiums rates before commencing construction.]

flood elevation. Structures must be permitted on an open foundation system. See [FEMA Technical Bulletin, TB 5, Free of Obstruction Requirements for Buildings Located in Coastal High Hazard Areas](#) for further guidance.

See NFIP: 44 CFR 60.3(e)(4)(i)

Elevation for V Zones is measured differently than those of A Zones. Note that the bottom of the lowest horizontal member must be one foot above BFE.

Required by NFIP: 44 CFR 60.3(e)(4)(ii)

Required by NFIP: 44 CFR 60.3(e)(4)(ii)

See [FEMA – 55 Coastal Construction Manual](#)

Required by NFIP: 44 CFR 60.3(e)(5)

Required by NFIP: 44 CFR 60.3(e)(5)

Required by NFIP: 44 CFR 60.3(e)(5)
Please note: The regulatory side of the NFIP does not limit the size of enclosures, however, enclosures over 300 SF will be rated as having an obstruction, which will mean higher insurance rates.

Although the NFIP recognizes the use of breakaway walls, this practice is discouraged because once the walls have been constructed, the owner frequently finishes off the interior and provides for human habitation in violation of the ordinance and the NFIP.

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Required by NFIP: 44 CFR 60.3(e)(4).

- c. require a registered professional engineer or architect to:

Link to [Coastal Construction Manual](#)

- (1) develop or review the structural design, specifications, and plans for the construction, which must meet or exceed the technical criteria contained in the FEMA-55Coastal Construction Manual; and,

A V-Zone Certificate can be used to accomplish this. Severe hurricanes have proven that structures built to meet the Coastal Construction Manual standards survive with very little damage when compared to structures that were built before the program standards were developed.

- (2) certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the criteria of Article VI.P.2.

Required by NFIP: 44 CFR 60.3(e)(6)

Required by NFIP: 44 CFR 60.3(e)(7)

- 3. The use of fill for structural support in Zones V1-30 and VE is prohibited.

Required by NFIP: 44 CFR 60.3(e)(5)

- 4. Human alteration of sand dunes within Zones V1-30 and VE is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.

- 5. The area below the lowest floor shall be used solely for parking vehicles, building access, and storage.

- 6. Conditional Use - Lobster sheds and fishing sheds may be located seaward of mean high tide and shall be exempt from the elevation requirement in Article VI.G. only if permitted as a Conditional Use following review and approval by the Planning Board, as provided in Article VII, and if all the following requirements and those of Article VI.A., VI.K., and VI.L. are met:

Provisions for Conditional Use are not included in the NFIP regulations. Due to the State of Maine's strict variance criteria it would be difficult for lobster and fishing sheds to obtain a variance from the requirements of Article VI.G. and VI.P.1. The State Maine Floodplain Management Program received guidance from FEMA on developing standards and procedures (see Article VII) for allowing Conditional Use Permits for these specific structures. The standards set forth in the ordinance are not negotiable and must be the same as the model ordinance.

- a. The conditional use shall be limited to low value structures such as metal or wood sheds 200 square feet or less and shall not exceed more than one story.
- b. The structure shall be securely anchored to the wharf or pier to resist flotation, collapse, and lateral movement due to the effect of wind and water loads acting simultaneously on all building components.
- c. The structure will not adversely increase wave or debris impact forces affecting nearby buildings.
- d. The structure shall have unfinished interiors and shall not be used for human habitation.

- e. Any mechanical, utility equipment and fuel storage tanks must be anchored and either elevated or floodproofed to one foot above the base flood elevation.
- f. All electrical outlets shall be ground fault interrupt type. The electrical service disconnect shall be located on shore above the base flood elevation and when possible outside the Special Flood Hazard Area.

ARTICLE VII - CONDITIONAL USE REVIEW

The Planning Board shall hear and decide upon applications for conditional uses provided for in this Ordinance. The Planning Board shall hear and approve, approve with conditions, or disapprove all applications for conditional uses. An applicant informed by the _____ that a Conditional Use Permit is required shall file an application for the permit with the Planning Board.

Provisions for Conditional Use are not included in the NFIP regulations. Due to the State of Maine's strict variance criteria, the Maine Floodplain Management Program received guidance from FEMA on developing a Conditional Use review and permitting process.

- A. Review Procedure for a Conditional Use Flood Hazard Development Permit
 - 1. The Flood Hazard Development Permit Application with additional information attached addressing how each of the conditional use criteria specified in the Ordinance will be satisfied, may serve as the permit application for the Conditional Use Permit.
 - 2. Before deciding any application, the Planning Board shall hold a public hearing on the application within thirty days of their receipt of the application.
 - 3. If the Planning Board finds that the application satisfies all relevant requirements of the ordinance, the Planning Board must approve the application or approve with conditions within 45 days of the date of the public hearing.
 - 4. A Conditional Use Permit issued under the provisions of this Ordinance shall expire if the work or change involved is not commenced within 180 days of the issuance of the permit by the Planning Board.
 - 5. The applicant shall be notified by the Planning Board in writing over the signature of the Chairman of the Planning Board that flood insurance is not available

MAINE MODEL FLOODPLAIN MANAGEMENT ORDINANCE WITH COMMENTARY

for structures located entirely over water or seaward of mean high tide.

B. Expansion of Conditional Uses

1. No existing building or use of premises may be expanded or enlarged without a permit issued under this section if that building or use was established or constructed under a previously issued Conditional Use Permit or if it is a building or use which would require a Conditional Use Permit if being newly-established or constructed under this Ordinance.

ARTICLE VIII - CERTIFICATE OF COMPLIANCE

No land in a special flood hazard area shall be occupied or used and no structure which is constructed or substantially improved shall be occupied until a Certificate of Compliance is issued by the Code Enforcement Officer subject to the following provisions:

A. For New Construction or Substantial Improvement of any elevated structure the applicant shall submit to the Code Enforcement Officer:

1. an Elevation Certificate completed by a Professional Land Surveyor, registered professional engineer, or architect, for compliance with Article VI, paragraphs F., G., H., or P.; and,
2. for structures in Zones V1-30, VE, and Coastal AE Zone (as defined), certification by a registered professional engineer or architect that the design and methods of construction used are in compliance with Article VI.P.2.

B. The applicant shall submit written notification to the Code Enforcement Officer that the development is complete and complies with the provisions of this ordinance.

C. Within 10 working days, the _____ shall:

1. review the required certificate(s) and the applicant's written notification; and,
2. upon determination that the development conforms to the provisions of this ordinance, shall issue a Certificate of Compliance.

This section is designed to assist in administration, enforcement and record keeping.

A final Elevation Certificate is required and will assure that the "as built" elevations render the development in compliance with the elevation requirement in Article VI.

An Elevation Certificate is also required in order to purchase flood insurance for Post-FIRM structures.

The number of working days is a community option. It may be changed to fit your community's criteria.

Required certificates may include an Elevation Certificate, Floodproofing Certificate, V Zone Certificate, and/or Hydraulic Openings Certificate.

ARTICLE IX - REVIEW OF SUBDIVISION AND

DEVELOPMENT PROPOSALS

The Planning Board shall, when reviewing subdivisions and other proposed developments that require review under other federal law, state law, local ordinances or regulations, and all projects on 5 or more disturbed acres, or in the case of manufactured home parks divided into two or more lots, assure that:

- A. All such proposals are consistent with the need to minimize flood damage.
- B. All public utilities and facilities, such as sewer, gas, electrical and water systems are located and constructed to minimize or eliminate flood damages.
- C. Adequate drainage is provided in order to reduce exposure to flood hazards.
- D. All proposals include base flood elevations, flood boundaries, and, in a riverine floodplain, floodway data. These determinations shall be based on engineering practices recognized by the Federal Emergency Management Agency.
- E. Any proposed development plan must include a condition of plan approval requiring that structures on any lot in the development having any portion of its land within a Special Flood Hazard Area, are to be constructed in accordance with Article VI of this ordinance. Such requirement will be included in any deed, lease, purchase and sale agreement, or document transferring or expressing an intent to transfer any interest in real estate or structure, including but not limited to a time-share interest. The condition shall clearly articulate that the municipality may enforce any violation of the construction requirement and that fact shall also be included in the deed or any other document previously described. The construction requirement shall also be clearly stated on any map, plat, or plan to be signed by the Planning Board or local reviewing authority as part of the approval process.

This is more restrictive than the NFIP standards at 44 CFR 60.3 (b)(3) which sets a threshold of development greater than 50 lots or 5 acres, whichever is the lesser.

Required by NFIP: 44 CFR 60.3(a)(4)(i)

Required by NFIP: 44 CFR 60.3(a)(4)(ii)

Required by NFIP: 44 CFR 60.3(a)(4)(iii)

Required by NFIP: 44 CFR 60.3(b)(3), and by Title 30-A MRSA §4404. In Zone A, the developer/sub-divider is responsible for determining the base flood elevation using a FEMA approved engineering method.

Required by the State Subdivision Law, Title 30-A MRSA §4404.

Several Maine communities did not require a subdivision to meet this standard at the time of approval but were later directed to correct the problem after the subdivision was recorded in the Registry of Deeds.

ARTICLE X - APPEALS AND VARIANCES

The Board of Appeals of the (Town/City) of _____ may, upon written application of an aggrieved party, hear and decide appeals where it is alleged that there is an error in any order, requirement, decision, or determination made by, or failure to act by, the Code Enforcement Officer or Planning Board in the administration or enforcement of the provisions of this Ordinance.

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The Board of Appeals may grant a variance from the requirements of this Ordinance consistent with state law and the following criteria:

- A. Variances shall not be granted within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result. *Required by NFIP: 44 CFR 60.6(a)(1)*
- B. Variances shall be granted only upon:
1. a showing of good and sufficient cause; and, *Required by NFIP: 44 CFR 60.6(a)(3)(i)*
 2. a determination that should a flood comparable to the base flood occur, the granting of a variance will not result in increased flood heights, additional threats to public safety, public expense, or create nuisances, cause fraud or victimization of the public or conflict with existing local laws or ordinances; and, *Required by NFIP: 44 CFR 60.6(a)(3)(iii)*
 3. a showing that the issuance of the variance will not conflict with other state, federal or local laws or ordinances; and, *Required by NFIP: 44 CFR 60.6(a)(3)(iii)*
 4. a determination that failure to grant the variance would result in "undue hardship," which in this sub-section means:
 - a. that the land in question cannot yield a reasonable return unless a variance is granted; and,
 - b. that the need for a variance is due to the unique circumstances of the property and not to the general conditions in the neighborhood; and,
 - c. that the granting of a variance will not alter the essential character of the locality; and,
 - d. that the hardship is not the result of action taken by the applicant or a prior owner.*Required by State law: Title 30-A MRSA §4353*
- C. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief, and the Board of Appeals may impose such conditions to a variance as is deemed necessary. *Required by NFIP: 44 CFR 60.6(a)(4)*
- D. Variances may be issued for new construction, substantial improvements, or other development for the conduct of a functionally dependent use provided that: *Required by NFIP: 44 CFR 60.6(a)(7)*

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1. other criteria of Article X and Article VI.K. are met; and,
2. the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

E. Variances may be issued for the repair, reconstruction, rehabilitation, or restoration of Historic Structures upon the determination that:

Required by NFIP: 44 CFR 60.6(a)

1. the development meets the criteria of Article X, paragraphs A. through D. above; and,
2. the proposed repair, reconstruction, rehabilitation, or restoration will not preclude the structure's continued designation as a Historic Structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

F. Any applicant who meets the criteria of Article X, paragraphs A. through E. shall be notified by the Board of Appeals in writing over the signature of the Chairman of the Board of Appeals that:

Required by the NFIP: 44 CFR 60.6(a)(5)

1. the issuance of a variance to construct a structure below the base flood level will result in greatly increased premium rates for flood insurance up to amounts as high as \$25 per \$100 of insurance coverage;

Required by NFIP: 44 CFR 60.6(a)(5)(i)

2. such construction below the base flood level increases risks to life and property; and,

Required by NFIP: 44 CFR 60.6(a)(5)(ii)

3. the applicant agrees in writing that the applicant is fully aware of all the risks inherent in the use of land subject to flooding, assumes those risks and agrees to indemnify and defend the municipality against any claims filed against it that are related to the applicant's decision to use land located in a floodplain and that the applicant individually releases the municipality from any claims the applicant may have against the municipality that are related to the use of land located in a floodplain.

Required by Title 14 MRSA §8101 et. seq. and 42 USC § 1983

G. Appeal Procedure for Administrative and Variance Appeals

1. An administrative or variance appeal may be taken to the Board of Appeals by an

G.1. through 5. and G.7. were added based on guidance received from the Office of the Maine Attorney General.

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aggrieved party within thirty days after receipt of a written decision of the Code Enforcement Officer or Planning Board.

2. Upon being notified of an appeal, the Code Enforcement Officer or Planning Board, as appropriate, shall transmit to the Board of Appeals all of the papers constituting the record of the decision appealed from.
3. The Board of Appeals shall hold a public hearing on the appeal within thirty-five days of its receipt of an appeal request.
4. The person filing the appeal shall have the burden of proof.
5. The Board of Appeals shall decide all appeals within thirty-five days after the close of the hearing, and shall issue a written decision on all appeals.
6. The Board of Appeals shall submit to the _____ a report of all variance actions, including justification for the granting of the variance and an authorization for the _____ to issue a Flood Hazard Development Permit, which includes any conditions to be attached to said permit.
7. Any aggrieved party who participated as a party during the proceedings before the Board of Appeals may take an appeal to Superior Court in accordance with State laws within forty-five days from the date of any decision of the Board of Appeals.

Required by NFIP: 44 CFR 60.6(a)(6)

In both blanks, identify the appropriate community official, i.e. the Code Enforcement Officer and/or Planning Board, as appropriate.

ARTICLE XI - ENFORCEMENT AND PENALTIES

- A. It shall be the duty of the Code Enforcement Officer to enforce the provisions of this Ordinance pursuant to Title 30-A MRSA § 4452.
- B. The penalties contained in Title 30-A MRSA § 4452 shall apply to any violation of this Ordinance.
- C. In addition to other actions, the Code Enforcement Officer shall, upon identifying a violation, submit a declaration to the Administrator of the Federal Insurance Administration requesting a flood insurance denial. The valid declaration shall consist of;
 1. the name of the property owner and address or legal description of the property sufficient to confirm its identity or location;

Required by NFIP: 44 CFR 73.3

2. a clear and unequivocal declaration that the property is in violation of a cited State or local law, regulation, or ordinance;
3. a clear statement that the public body making the declaration has authority to do so and a citation to that authority;
4. evidence that the property owner has been provided notice of the violation and the prospective denial of insurance; and,
5. a clear statement that the declaration is being submitted pursuant to Section 1316 of the National Flood Insurance Act of 1968, as amended.

ARTICLE XII - VALIDITY AND SEVERABILITY

If any section or provision of this Ordinance is declared by the courts to be invalid, such decision shall not invalidate any other section or provision of this Ordinance.

ARTICLE XIII - CONFLICT WITH OTHER ORDINANCES

This Ordinance shall not in any way impair or remove the necessity of compliance with any other applicable rule, ordinance, regulation, bylaw, permit, or provision of law. Where this Ordinance imposes a greater restriction upon the use of land, buildings, or structures, the provisions of this Ordinance shall control.

ARTICLE XIV - DEFINITIONS

Unless specifically defined below, words and phrases used in this Ordinance shall have the same meaning as they have at common law, and to give this Ordinance its most reasonable application. Words used in the present tense include the future, the singular number includes the plural, and the plural number includes the singular. The word "may" is permissive; "shall" is mandatory and not discretionary.

Accessory Structure - means a structure which is on the same parcel of property as a principal structure and the use of which is incidental to the use of the principal structure.

Adjacent Grade - the natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Area of Shallow Flooding - a designated AO and AH zone on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one to

Definition taken from NFIP: 44 CFR 59.1

three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of Special Flood Hazard - land in the floodplain having a one percent or greater chance of flooding in any given year, as specifically identified in the Flood Insurance Study cited in Article I of this Ordinance.

Definition taken from NFIP: 44 CFR 59.1

Base Flood – a flood having a one percent chance of being equaled or exceeded in any given year, commonly called the 100-year flood.

Definition taken from NFIP: 44 CFR 59.1

Basement - area of a building that includes a floor that is subgrade (below ground level) on all sides.

Definition taken from NFIP: 44 CFR 59.1

Breakaway Wall - a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Definition taken from NFIP: 44 CFR 59.1

Building - see **Structure**.

Certificate of Compliance - a document signed by the Code Enforcement Officer stating that a structure is in compliance with all of the provisions of this Ordinance.

Definition taken from NFIP: 44 CFR 59.1

Coastal AE Zone – The portion of the Coastal High Hazard Area with wave heights between 1.5 feet and 3.0 feet and bounded by a line labeled the “Limit of Moderate Wave Action” (LiMWA) on a Flood Insurance Rate Map (FIRM). VE Zone floodplain construction standards are applied to development, new construction, and substantial improvements in the Coastal AE Zone.

Coastal High Hazard Area - An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. Coastal High Hazard Areas are designated as Zone VE and Zone AE bounded by a line labeled “Limit of Moderate Wave Action” (LiMWA) on a Flood Insurance Rate Map (FIRM).

Definition taken from NFIP: 44 CFR 59.1

Code Enforcement Officer – a person certified under Title 30-A MRSA, Section 4451 (including exceptions in Section 4451, paragraph 1) and employed by a municipality to enforce all applicable comprehensive planning and land use laws.

Conditional Use - a use that, because of its potential impact on surrounding areas and structures, is permitted only upon review and approval by the Planning Board pursuant to Article VII.

Not required by NFIP. Definition developed by the State of Maine as part of the Conditional Use review and permitting process.

Containment Wall – wall used to convey or direct storm water or sanitary water from the initial source to the final destination.

Definition from www.structurecast.com

Development – a manmade change to improved or unimproved real estate. This includes, but is not limited to, buildings or other structures; mining, dredging, filling, grading, paving, excavation, drilling operations or storage of equipment or materials; and the storage, deposition, or extraction of materials.

Definition taken from NFIP: 44 CFR 59.1

Digital Flood Insurance Rate Map (FIRM) – see **Flood Insurance Rate Map**

Elevated Building - a non-basement building that is:

Definition taken from NFIP: 44 CFR 59.1

- a. built, in the case of a building in Zones A1-30, AE, A, AO, or AH, so that the top of the elevated floor, or in the case of a building in Zones V1-30, VE, or Coastal AE Zone, to have the bottom of the lowest horizontal structural member of the elevated floor, elevated above the ground level by means of pilings, columns, post, or piers; and,
- b. adequately anchored to not impair the structural integrity of the building during a flood of up to one foot above the magnitude of the base flood.

In the case of Zones A1-30, AE, A, AO, or AH, **Elevated Building** also includes a building elevated by means of fill or solid foundation perimeter walls with hydraulic openings sufficient to facilitate the unimpeded movement of flood waters, as required in Article VI.L. In the case of Zones V1-30, VE, or Coastal AE Zones, **Elevated Building** also includes a building otherwise meeting the definition of elevated building, even though the lower area is enclosed by means of breakaway walls, if the breakaway walls meet the standards of Article VI.P.2.b.(3).

Elevation Certificate - an official form (FEMA Form 81-31, as amended) that:

- a. is used to verify compliance with the floodplain management regulations of the National Flood Insurance Program; and,
- b. Is required for purchasing flood insurance.

Flood or Flooding

- a. A general and temporary condition of partial or complete inundation of normally dry land areas from:
 1. The overflow of inland or tidal waters.

Definition taken from NFIP: 44 CFR 59.1

2. The unusual and rapid accumulation or runoff of surface waters from any source.
- b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph a.1. of this definition.

Flood Elevation Study - an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.

Definition taken from NFIP: 44 CFR 59.1

Flood Insurance Rate Map (FIRM) - an official map of a community, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

Definition taken from NFIP: 44 CFR 59.1

Flood Insurance Study - see **Flood Elevation Study**.

Floodplain or Floodprone Area - land area susceptible to being inundated by water from any source (see flooding).

Definition taken from NFIP: 44 CFR 59.1

Floodplain Management - means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

Definition taken from NFIP: 44 CFR 59.1

Floodplain Management Regulations - zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance, and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Definition taken from NFIP: 44 CFR 59.1

Floodproofing - any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and contents.

Definition taken from NFIP: 44 CFR 59.1

Floodway - see **Regulatory Floodway**.

Floodway Encroachment Lines - the lines marking the limits of floodways on federal, state, and local floodplain maps.

Definition taken from NFIP: 44 CFR 59.1

Freeboard - a factor of safety usually expressed in

feet above a flood level for purposes of floodplain management. Freeboard tends to compensate for the many unknown factors, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed, which could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions.

Functionally Dependent Use - a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

Definition taken from NFIP: 44 CFR 59.1

Historic Structure - means any structure that is:

Definition taken from NFIP: 44 CFR 59.1

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district;
- c. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or,
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
 1. By an approved state program as determined by the Secretary of the Interior, or,
 2. Directly by the Secretary of the Interior in states without approved programs.

Limit of Moderate Wave Action (LiMWA) – The landward limit of the 1.5 foot breaking wave within a Coastal AE Zone. These areas are bounded by a line labeled “Limit of Moderate Wave Action” (LiMWA) on a Flood Insurance Rate Map (FIRM). The LiMWA line delineates that portion of the Special Flood Hazard Area (SFHA) landward of a VE zone in which the principal sources of flooding are astronomical high tides, storm surges, or tsunamis, not riverine sources. These areas may be subject to wave effects, velocity flows, erosion, scour, or

If the community is mandated to enforce the IBC/IRC, then the community must also enforce V Zone standards in the LiMWA area.

If the community is not mandated to enforce the IBC/IRC, then enforcement of the LiMWA is optional.

combinations of these forces. The floodplain development and construction standards for VE Zones will be applied in the Coastal AE Zone.

Locally Established Datum - for purposes of this ordinance, an elevation established for a specific site to which all other elevations at the site are referenced. This elevation is generally not referenced to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD), or any other established datum and is used in areas where Mean Sea Level data is too far from a specific site to be practically used.

Lowest Floor - the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements described in Article VI.L. of this Ordinance.

Definition taken from NFIP: 44 CFR 59.1

Manufactured Home - a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term manufactured home also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days.

Definition taken from NFIP 44 CFR 59.1

Manufactured Home Park or Subdivision - a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

Definition taken from NFIP: 44 CFR 59.1

Mean Sea Level – when related to the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD), or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.

Definition taken from NFIP: 44 CFR 59.1

Minor Development - means all development that is not new construction or a substantial improvement, such as repairs, maintenance, renovations, or additions, whose value is less than 50% of the market value of the structure. It also includes, but is not limited to: accessory structures as provided for in Article VI.J., mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; and non-structural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.

Definition developed by the MFMP to support the review and permitting process of development projects that do not involve new construction or substantial improvement of structures.

National Geodetic Vertical Datum (NGVD) - the national vertical datum, a standard established in 1929, which is used by the National Flood Insurance Program (NFIP). NGVD is based upon mean sea level in 1929 and also has been called "1929 Mean

Sea Level (MSL)".

New Construction - structures for which the "start of construction" commenced on or after the effective date of the initial floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

Definition taken from NFIP: 44 CFR 59.1

North American Vertical Datum (NAVD) - means the national datum whose standard was established in 1988, which is the new vertical datum used by the National Flood Insurance Program (NFIP) for all new Flood Insurance Rate Maps. NAVD is based upon vertical datum used by other North American countries such as Canada and Mexico and was established to replace NGVD because of constant movement of the earth's crust, glacial rebound and subsidence, and the increasing use of satellite technology.

100-year flood - see **Base Flood**.

Recreational Vehicle - a vehicle that is:

Definition taken from NFIP: 44 CFR 59.1

- a. built on a single chassis;
- b. 400 square feet or less when measured at the largest horizontal projection, not including slideouts;
- c. designed to be self-propelled or permanently towable by a motor vehicle; and,
- d. designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Regulatory Floodway –

Definition taken from NFIP: 44 CFR 59.1

- a. the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot, and,
- b. when not designated on the community's Flood Insurance Rate Map or Flood Boundary and Floodway Map, it is considered to be the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.

Riverine - relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Definition taken from NFIP: 44 CFR 59.1

Special Flood Hazard Area - see **Area of Special Flood Hazard**.

Definition taken from NFIP: 44 CFR 59.1

Start of Construction - the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition,

Definition taken from NFIP: 44 CFR 59.1

placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, or modification of any construction element, whether or not that alteration affects the external dimensions of the building.

Structure - means, for floodplain management purposes, a walled and roofed building. A gas or liquid storage tank that is principally above ground is also a structure.

Definition taken from NFIP: 44 CFR 59.1

Substantial Damage - means, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Definition taken from NFIP: 44 CFR 59.1

Substantial Improvement - means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:

Definition taken from NFIP: 44 CFR 59.1

- a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
- b. Any alteration of a Historic Structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, and a variance is obtained from the Board of Appeals.

Variance - means a grant of relief by a community from the terms of a floodplain management regulation.

Definition taken from NFIP: 44 CFR 59.1

Violation - means the failure of a structure or development to comply with a community's floodplain management regulations.

Definition taken from NFIP: 44 CFR 59.1

ARTICLE XV - ABROGATION

This ordinance repeals and replaces any municipal ordinance previously enacted to comply with the National Flood Insurance Act of 1968 (P.L. 90-488, as amended).

State Model Ordinance 60.3(e) LiMWA

CHAPTER II – FLOODPLAIN DATA

Chapter Summary

Floodplain regulations address the Special Flood Hazard Area (SFHA), an area flooded during the base flood. The SFHA is best defined by elevation. Because of map inaccuracies, the key to good floodplain regulation is to use the best available elevation data. If a base flood elevation is not found in your Flood Insurance Study, contact the Maine Floodplain Management Program for assistance. Special rules governing riverine floodplains were created to ensure that flood flows are not obstructed or otherwise cause an increase in flood damage. These rules apply to floodways even if these areas are not mapped. Refer to the definition of “regulatory floodway” in the Model Ordinance.

The Base Flood

There is a one percent, or 1 out of 100 chance, of a base flood occurring in any given year. Over a long period of time (e.g., several thousand years), base floods occur on the average once in every 100 years. Given these statistics, the base flood has also been called the 1 percent or the 100-year flood. Another term frequently used to describe the base flood is regulatory flood. A base flood is a flood that is calculated for regulation purposes. In 1968 when Congress passed the National Flood Insurance Act, they agreed to establish the 100-year flood as the regulatory standard. Most individuals believe that when we say a 100-year flood, a flood of that magnitude happens at least once every 100 years. That is not the case. The 100-year or base flood is a statistical probability. In reality a 100-year flood has a 63% chance of occurring in any given 100-year period.

A flood occurs when heavy rains or snowmelt send more water downstream than the carrying channel can handle. A flood is typically seen as water flowing over the banks of a stream or river. A flood also occurs when low areas fill up faster than they can be drained (ponding), or when water flows along the surface without a channel (sheet flow).

Flooding occurs in coastal areas during periods of storm activity that result in higher than normal tides and wave height, increased by winds and atmospheric conditions. Water levels and waves wash over portions of coastal lands that may otherwise be safe.

Poor drainage or sewer problems may also cause flooding. Problems of this nature are addressed by local building regulations and may not be included on regulatory flood maps. For regulatory purposes, flood refers to surface water flooding.

Utilizing base flood data permits all communities to apply regulations using the same standard. A 100-year occurrence sounds remote, but the base flood hazard exists equally every year. A 100-year flood can, and has, occurred twice in the same year. A community that experiences a 100-year flood this year has the same 1% odds of seeing a 100-year flooding event the following year.

Special Flood Hazard Area

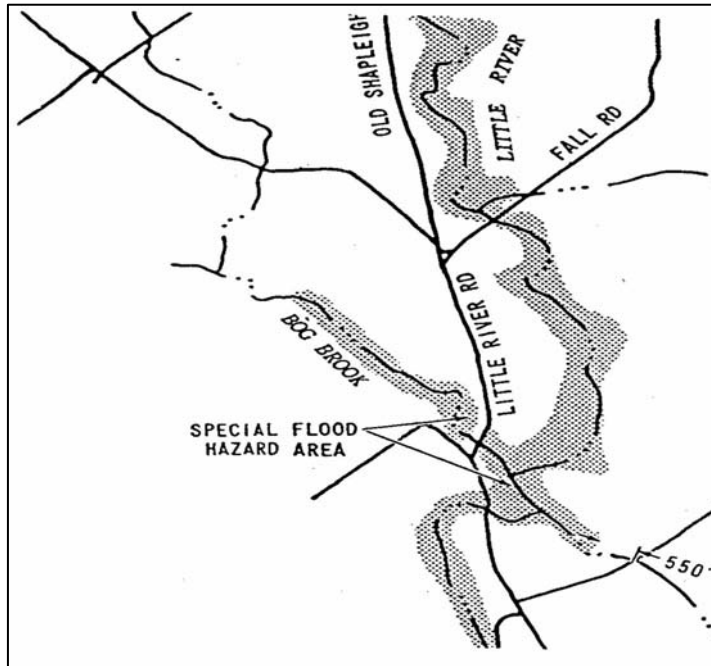
For NFIP purposes, the SFHA is that which would be inundated by the base flood. The SFHA is indicated on a FEMA Flood Hazard Boundary Map (FHBM) for communities still in the emergency phase of the program, or a Flood Insurance Rate Map (or FIRM) for communities that have or are about to enter the regular phase of the program. Flood Insurance Rate Maps can be either approximate or detailed.

Return Frequency:

Time	10-yr-flood	25-yr-flood	50-yr-flood	100-yr flood
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%
100 years	99.9%	98%	87%	63%

CHAPTER II – FLOODPLAIN DATA

Flood Hazard Boundary Maps



Few Maine communities are still in the NFIP Emergency Phase. When the NFIP mapping was initiated in the 1970s, the Federal Insurance Administration (FIA) developed Flood Hazard Boundary Maps (FHBMs) for each community without the benefit of detailed studies or hydraulic analyses. These maps approximated SFHA boundaries but did not include elevations. The SFHA is shown as a shaded area and labeled Zone A. The maps, often referred to as flat maps, are typically large scale, requiring interpretation in order to determine the ground location of SFHAs.

The FIA performed more detailed Flood Insurance Studies for communities as Congressional funding was appropriated. Such studies resulted in the creation of Flood Insurance Rate Maps (FIRMs). For some small Maine communities with very little development at risk of flooding, the FIA did not conduct a detailed flood study, but essentially reissued the same map that was labeled the FHBM as a FIRM. In some instances, FEMA

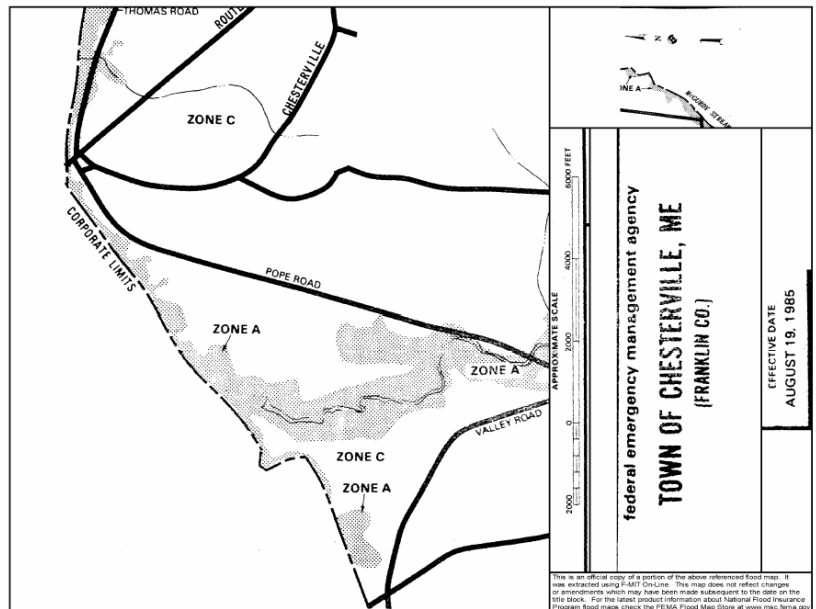
converted the FHBM to a FIRM by issuing a letter that instructs the community to replace the letters FHBM with the word FIRM. The Special Flood Hazard Areas, on the FHBM, are converted to Zone A.

A FHBM is created for communities with extremely low risk of flooding; little or no remap is based on Federal budget constraints. Such communities are labeled (L) in the FEMA Community Status Book. The “L” stands for conversion by Letter. At the top of this page is a map of part of York County, Maine showing this region on an FHBM. The map at the bottom of the page is FIRM that was converted from a FHBM by simply changing the title block and including Zone labels as Zone A for SFHA or Zone C for areas not floodprone

Approximate Flood Insurance Rate Maps

A sample Approximate FIRM is shown to the right on this page. These maps were created for communities in which FIA determined there is minimal flooding risk. An approximate FIRM shows the area that would be subject to flooding in the event of the base flood. In the absence of a detailed study, a FIRM shows only the boundaries of the floodplain; it does not show any flood elevations. The approximate SFHA is labeled Zone A. This zone is the base floodplain. Development in that area must meet the requirements of the local floodplain ordinance. These communities are identified in the Maine Community Status Book by an (M) designation.

Zone C (or X) on an approximate FIRM indicates an area with minimal flood hazards that do not require NFIP regulation. While floodways are not delineated on approximate FIRMs, the model ordinance provides a method for determining the width of the floodway and floodways will be discussed later in this chapter.



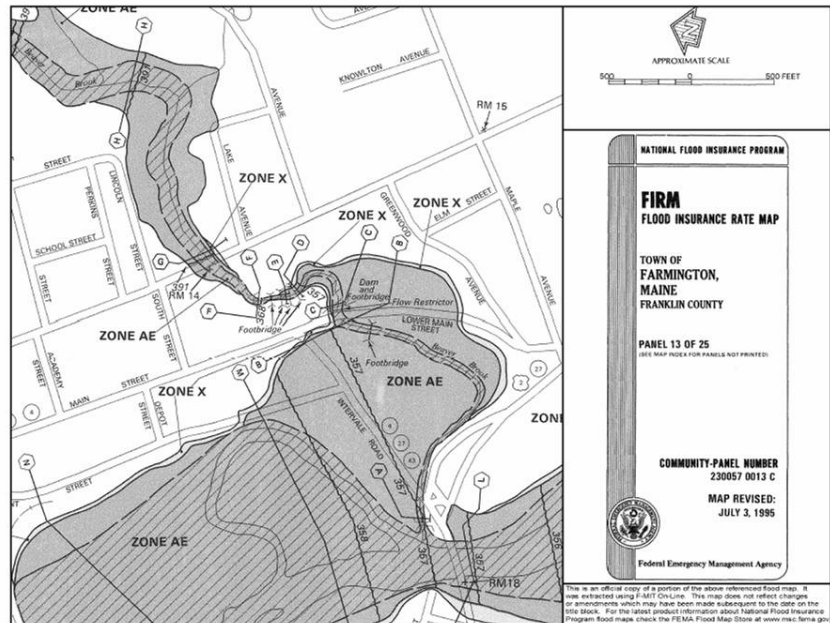
Reissued FHBM as a FIRM

CHAPTER II – FLOODPLAIN DATA

Detailed FIRMs

When a detailed study was justified (along the coast, along major rivers, and around major lakes), a detailed FIRM was produced. Within a community there may be areas for which a detailed study was conducted and areas for which only approximate flood boundaries were established. A detailed FIRM shows the boundaries of the base flood. (See portion of detailed FIRM below). Again, the SFHA is labeled as one of several types of A Zones or, in the case of coastal communities, V Zones. A FIRM may show the following zones or designations:

1. **Zone A** – Areas which have been determined by approximate methods to be Special Flood Hazard Areas. They show no elevations and are known as “unnumbered A zones.” Regulations for development apply to these areas.
2. **Zones A1 through A30 and Zone AE** - Zones where the elevation of the base flood has been calculated and is shown on the map, sometimes as a wavy line that crosses the floodplain. On newer maps or revisions after 1985, Zone AE is used rather than numbered A Zones. Regulations apply in these zones.



Portion of Detailed Flood Insurance Rate Map (FIRM)

3. **Zone AO** - An area of 100 year shallow flooding where depths are between one and three feet. Average depths of inundation may be shown, but no elevations are indicated. Regulations apply.
4. **Zone AH** - An area of 100 year shallow flooding with a constant water-surface elevation (usually areas of ponding) where average depths are between one and three feet. The BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Regulations apply to these areas.
5. **Zone B and (lightly shaded) Zone X** – Generally the 500 year flood zone. It may also indicate certain areas subject to 100 year flooding with average depths less than one foot or areas where the contributing drainage area is less than one square mile. Although we do not regulate in Zone B or Zone X under the NFIP, these mapped areas are reviewed by other federal agencies when siting critical facilities.
6. **Zone C** - An area of minimal flooding. The NFIP does not require regulation of development in Zone C.
7. **Zone D** - Areas where the magnitude of flooding has not been determined. Regulations do not apply to construction in these zones. There are currently no known Zone Ds in the State of Maine.
8. **Zone V** - Coastal areas subject to flooding with the additional hazards associated with storm waves. Due to lack of detailed study, no flood elevations or depths are shown. Regulations and additional construction specifications apply. There are currently no known unnumbered V Zones in the State of Maine.
9. **Zones V1 through V30 and Zone VE** - Numbered V Zones are areas along the coast subject to flooding with the additional hazards associated with storm waves. Flood elevations or depths are shown. The "V" denotes

CHAPTER II – FLOODPLAIN DATA

velocity due to storm surge. On newer maps or revisions, Zone VE may be used rather than numbered V Zones. Regulations and additional construction specifications apply.

10. **Zone X** - This is the same Zone as is referred to, in older maps, as Zone B or C. It denotes areas of lesser flood hazard. Regulations for construction do not apply to Zone X.
11. **Coastal Barrier Resources System (CBRS)** - Coastal barriers, and other protected areas identified by the Department of the Interior (DOI). A coastal barrier is a naturally occurring island, sandbar, or other strip of land, including coastal mainland, that protects the coast from severe wave wash. The Coastal Barrier Resources Act (1982) and the Coastal Barrier Improvement Act (1990) are federal laws that were enacted and implemented as part of a DOI initiative to minimize loss of human life by discouraging development in high risk areas, reduce wasteful expenditures of federal resources, and preserve the ecological integrity of CBRS and Otherwise Protected Areas (OPAs). The laws provide this protection by prohibiting all federal expenditures or financial assistance, including flood insurance, for residential and commercial development in these areas. There are, however, some existing buildings which may be eligible for flood insurance, depending on the date they were constructed or substantially improved.

The two images below include the FIRM portion of Main Street in downtown Farmington, and a photo of the same area when it was flooded by overflow from the Sandy River in January 2006. The arrow indicates the approximate location from which the photograph was taken. The FIRM indicates that this location is floodprone since it is located in or near identified X and AE zones. Since the Town of Farmington participates in the NFIP, business and residential property owners are able to purchase flood insurance.



CHAPTER II – FLOODPLAIN DATA

Making Map Determinations

The Flood Insurance Rate Map (FIRM) is used to determine if proposed development, or any part of it, is located within the Special Flood Hazard Area (SFHA). Development that falls within the SFHA is subject to the provisions of the local floodplain management ordinance. In order to make a determination, use the FIRM or FHBM index to locate the map panel for the development site. An asterisk on the panel number indicates that no flood hazard has been identified, or the entire area is situated in one flood zone and the panel was not printed. Be sure the map panel is the most recent one printed by comparing the panel suffix letter with the suffix letter shown on the current map index. Panels for some communities show different effective dates because revisions did not affect the whole community. The Community Status Book shows the most current effective map date.

It is most often helpful in doing flood hazard determinations to use a tax assessor's map indicating property boundaries. First, obtain the distance on the ground between the site and one or more identifiable points, i.e., the centerline of a road or street, a bridge, or some other cultural feature on the map. Using the map scale and the measured ground distance from these points, plot the site on the map. The degree of difficulty in locating the project site will largely depend on familiarity with the properties in the community and with the scale of the flood maps. Determinations are much more challenging when a large scale map is being used to identify property in a rural area.

If the site is within the mapped flood boundary, it is subject to the provisions of the local floodplain ordinance. If the site is clearly outside the flood boundary, no floodplain regulations apply unless the site adjoins the SFHA and surveyed ground elevations at the project site are below BFE. In this instance, the site would be considered floodprone.

Additional information and/or studies may be needed if it cannot be determined whether or not the site is located in a floodplain. In this instance, ground elevation, lowest adjacent grade elevation, and lowest floor elevations of any structures will be necessary for the site, therefore the applicant will have to hire a Professional Land Surveyor. A field visit and measurements on the ground may also be required. In a riverine environment, the actual site elevations should be compared to the base flood elevation, which is read from Flood Insurance Study profiles, if available.

If the site is near the floodway boundary, the same process is used to determine if any portion of the site is in the floodway. In this instance, measuring identifiable land features located on both the ground and the map will be required. Scale these distances on the map to determine site location relative to the floodway boundary. Because the floodway boundary is not based on a flood elevation, both field and map measurements are needed to assess whether the site is located in a floodway.

If the site is at a surveyed cross section, floodway width data from the FIS floodway data table may be used to supplement field and map measurements. Note that the width listed in the table is the distance from the floodway line on one side of the stream to the floodway line on the other side of the stream. This is important if the stream channel is the community boundary, so only about half of the floodway is shown on the community's FIRM.

If the width measured on the map at that site is not comparable to that shown in the table, the table data are to be used. If there is a significant difference, contact the FEMA regional office for an interpretation. The proportional width of the floodway from the center of the stream can be used to determine the floodway boundary on the ground.

In Zones A1-30, AE, and A riverine areas for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain as measured from the normal high water mark to the upland limit of the floodplain.

If any portion of the building site, proposed grading, filling, bridge or other development is determined to be within the floodway, then the floodway provisions of the ordinance also apply. If the proposed development lies in more than one zone, then the standards for the most restrictive zone will also apply to the development. For example, if any portion of the proposed construction is located in an AE Zone and a VE Zone, then the entire building must meet the VE Zone requirements.

CHAPTER II – FLOODPLAIN DATA

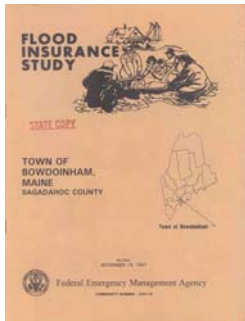
Base Flood Elevations

A base flood is that flood having a one percent chance of being equaled or exceeded in any given year. It is commonly called the 100-year flood. Therefore, a base flood elevation (BFE) would be defined as the elevation to which a body of water could be expected to rise during a 100-year flooding event.

FHBMs and FIRMs show the boundaries of the SFHA. These boundaries are only as accurate as the base map used to develop the FIRM (e.g.: a topographic map and, in Maine, a USGS quadrangle map). A more detailed explanation would be, if the flood elevation is 258 feet above sea level and the base map used to develop the FIRM shows a 20-foot contour interval, the map maker used intuitive judgment to locate the floodplain boundary between the 240 and 260 foot contour lines.

The actual surveyed elevation of the ground prevails for permitting. If the FIRM appears to be inaccurate, the applicant may wish to apply for a Letter of Map Amendment (LOMA). (See related discussion in Section H.) It is critical to secure base elevations, which can be found in a FEMA FIRM or a Flood Insurance Study. Both are discussed below.

Detailed FIRM and Flood Insurance Studies (FIS)



If you have a detailed FIRM with numbered A1-30, or AE Zones and/or V1-30 or VE Zones, the base flood elevation is on the map. Flood elevations on the FIRM are rounded to the nearest foot. The standard practice of displaying the base flood elevation on the FIRM is as follows: if the base flood elevation is between 0.1 and 0.4, the elevation is rounded down. If the elevation is between 0.5 and 0.9, the figure is rounded up. For insurance rating, the rounding is acceptable.

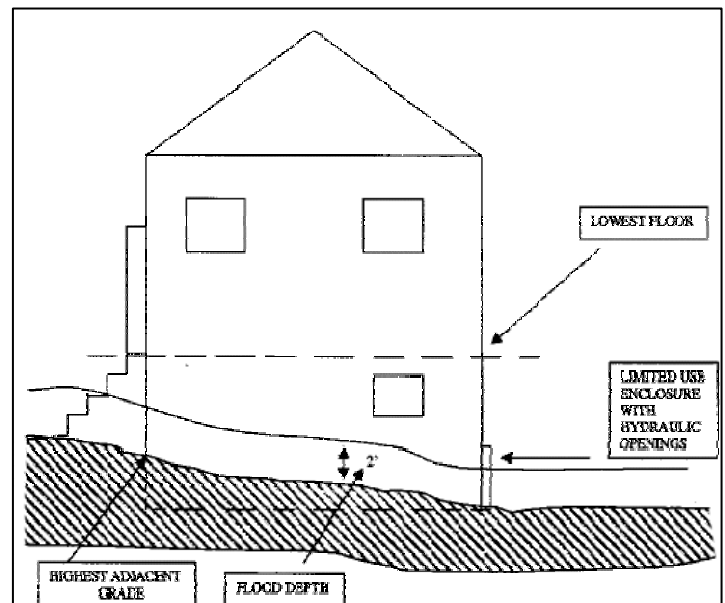
For floodplain management purposes and permitting, it is important to use the best or most exact number, even for areas shown between the mapped elevations areas. The FIS typically contains a flood profile for riverine floodplains. A flood profile is a graphic display of the elevation of a particular flood for the entire reach or the part of the stream that has been studied. Communities with a detailed FIRM have flood profiles in the last pages of the FIS text. This chapter also

contains a section on reading a profile.

More detail is also available in the FIS covering coastal flooding. The FIS typically contains a table or chart listing the base flood elevations for multiple areas of the community's coastline. Older coastal FIS may contain coastal profiles showing the wave run-up at transects that were surveyed as part of the original flooding analysis.

Some coastal floodplain areas mapped as AO Zones are also known as areas of sheet flow. AO Zones do not reflect the base flood elevation the same way as A1-30, AE, AH, V1-30, or VE Zones. In an AO Zone, the BFE is shown as the depth of flooding, usually one to three feet in depth. The floodplain management standard of elevating the lowest floor of the structure to at least one foot above flood elevation still applies.

If the FIRM shows an AO Zone flood depth of two feet, the lowest floor must be built three feet above the highest adjacent grade. This standard is different from the elevation standards for the other flood zones. It is important to note the lowest floor of the entire building must be at least one foot above the highest adjacent grade. This can be achieved by designing the structure on an open foundation system or on foundation walls with compliant hydraulic openings as shown here. It is not permissible to stair step the building down the slope.



AO Zone Structure with Hydraulic Openings

CHAPTER II – FLOODPLAIN DATA

Best Available Data

In approximate SFHAs (unnumbered A Zones), a community must look elsewhere for base flood elevation data. Often some other floodplain data exists.

Unnumbered A Zones

The following is a list of methods acceptable for determining the elevations in unnumbered A Zones.

1. Don't reinvent the wheel! Check the Maine Floodplain Management Program's website for the Best Available Data (BAD). The URL is <http://www.maine.gov/spo/flood/bad/>. The communities are listed alphabetically and you may have to scroll down to find the alpha link. You may click on the appropriate letter that begins the name of the community you need. If we have a BFE determined for the waterbody that you need we will post it here.

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Maine Floodplain Management Program Best Available Data for Unnumbered A Zones

The following table provides information about the best available data for certain water bodies which has been gathered by the Maine Floodplain Management Program for communities with unnumbered "A" zones on their Flood Insurance Rate Map or Flood Hazard Boundary Map. Additional guidance for dealing with unnumbered A Zones in Maine can be found in the article [Dealing with Unnumbered A Zones in Maine](#).

Although the Maine State Floodplain Management Program considers the information in the table below to be the best available data at the time this information was posted, it is the community's responsibility to decide what information it will use to administer its floodplain management regulations.

- It is the reader's responsibility to check with the community in which the water body lies to determine what information it will accept.
- It is the reader's responsibility to check FEMA's [Community Status Book](#) (360 KB) to determine if a more recent Flood Insurance Rate Map has been put into effect since the date of the information posted below.
- Further guidance on unnumbered A Zones can be found in FEMA's publications [Managing Floodplain Development in Approximate Zone A Areas](#) (665 KB) and [Use of Flood Insurance Study \(FIS\) Data as Available Data](#).

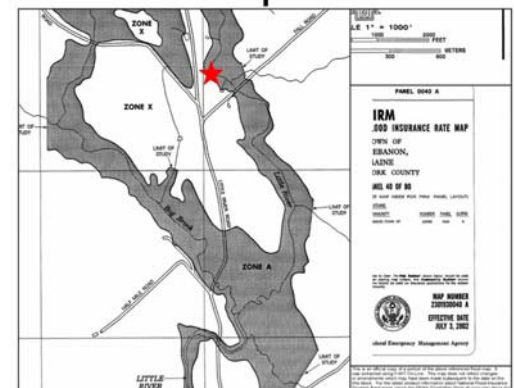
The base flood elevation indicated in these reports should be used as best available data, unless the community has more recent data available for the same water bodies. For most lakes and ponds, the base flood elevation (BFE) is provided. For data on rivers, brooks or streams, please contact the Maine Floodplain Management Program directly at (207) 287-8063. Paper copies of the source of Best Available Data can be provided.

BFE: Base Flood Elevation [in NGVD unless otherwise specified]
ACE: U.S. Army Corps of Engineers
BADL: Best Available Data Letter issued by FEMA

2. If a waterbody forms a boundary between two communities, the community on the other side of the river, lake or pond may have a detailed study. The base flood data for one side is valid for both sides. As we find these, they are being posted in the BAD listing on our website.
3. Hire a Professional Engineer to run the appropriate flood model and establish the BFE in the most scientific and defensible way. The most common riverine model is HEC/RAS developed by the US Army Corps of Engineers. It is the model used in most of Maine's Flood Insurance Studies done by FEMA for our communities along rivers. Other models are appropriate for lakes, ponds and wetlands and a different model is appropriate for ocean exposure.
4. Check with the state and federal agencies such as US Army Corps of Engineers, USDA/Soil Conservation Service, or USGS and ask if they have knowledge of any base flood elevation reports or other unpublished reports or data that may be of assistance for the stream in question.
5. If the property is along a stream that is near any state highway structures such as bridges or culverts, the Maine Department of Transportation may have done a study to properly size the structure. Call the

One method of producing Base Flood Elevations (BFE) is to overlay the firm of a given geographic area with a topographic image of the same area. Above are the two images that would be used to create a sample BFE.

The star on each map is a reference point for the overlay.



= BFE

CHAPTER II – FLOODPLAIN DATA

bridge design section of DOT. Their contact information can be found on the contacts list in the beginning pages of this handbook.

6. If there is a dam on the waterbody there is a good possibility that the dam owner has had to do a study to get relicensed.
7. Maine law requires developers of new subdivisions to provide base flood data if the subdivision is in a mapped floodplain. Check with the town to see if there have been any new subdivisions near the site in question. The recorded plan should have the BFE and floodplain boundary on it.
8. The Best Fit approach: Compare the shaded area of the Flood Insurance Rate Map (FIRM) with the contours on a USGS Quad map and determine which two contours the boundary of the shaded area falls between and interpolate which contour best approximates the boundary of the shaded area and use that contour and the elevation as the regulatory flood elevation. This is best done by someone familiar with contour mapping and that is familiar with “the lay of the land” in question. See the example on page 2-6.
9. Another method is the use of historical records or the flood of record. Once you know the date of the flood of record you may be able to establish that flood’s return frequency by looking at the river basin report on the Maine Floodplain Management Website <http://www.maine.gov/spo/flood/> to see if a return frequency has been established for the event. You will first need to establish which major river basin your area is located or you may contact the USGS (207-622-8201) or National Weather Service (NWS) at 207-688-3216 and ask if they have the return frequency for that specific event. If the event is less than a 100-year flooding event, the elevation information is not appropriate for determining the needed BFE.

DOCUMENTATION: Whatever method you choose to use in determining the flood elevation for an unnumbered A Zone, always document on the permit application where the determination came from. It is also advisable to write the source on the FIRM or Flood Hazard Boundary Map (FHBM) that you use in the administration of the ordinance. Consistency is extremely important when working with unnumbered A Zones.

If you have any questions regarding the Flood Profile, contact the staff of the Maine Floodplain Management Program. (Contact names and phone numbers are in the front of the handbook.) Code officials should at least be familiar with the procedure for checking elevations in the field. These procedures are presented in Appendix C. Along many river basins in Maine, the USDA/Natural Resources Conservation Service or the USGS have conducted flood studies. Regional Councils may also have copies of previous flood studies on file.

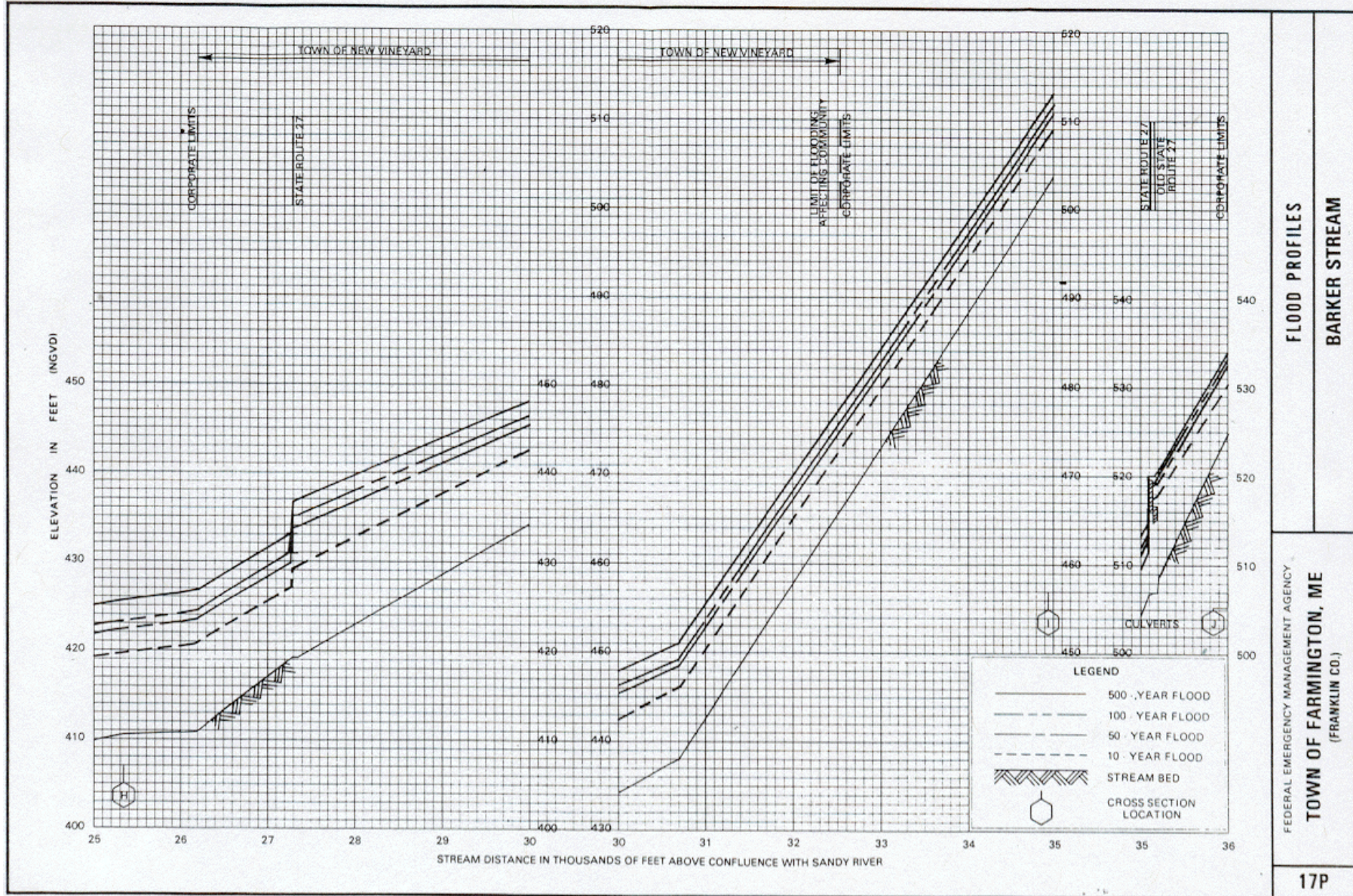
Reading a Flood Profile

The Flood Profile of Barker Stream in Farmington, Maine, is used to illustrate the discussion below, which covers how to address flood profile data. This chart is shown on the next page.

1. Check the scales used. On the example following, each bold line on the horizontal axis represents 100 feet along the stream. On the vertical axis, each line represents one half foot elevation above sea level.
2. Locate the point of concern on the horizontal axis. This is usually done by knowing its distance upstream or downstream from a point shown on the profile. Example: the point of concern is about 750 feet downstream from corporate limit between Farmington and New Vineyard. (See page 2-9 along with the Flood Boundary and Floodway Map on page 2-10. The cross sections on the profile are located at the place indicated by the lines crossing the floodway tagged with the hexagons with corresponding letters – e.g., cross section H.)
3. Locate the point of concern on the line that represents the flood in which you are interested. Our flood of concern is the base flood or the 100-year flood line on the profile which is the second diagonal line down from the top of the profile sheet on 2-9.

Read the vertical axis. By reading the profile sheet at Cross Section H we can see that the elevation of the 100-year flood is 423 feet plus part of another small box on the grid. We need to interpolate and reasonable interpretation would be 423.2 feet vertical elevation or more precisely 423.2 feet NGVD which is the vertical datum used in the Farmington FIS. The 10-year flood elevation is 419.9 feet NGVD.

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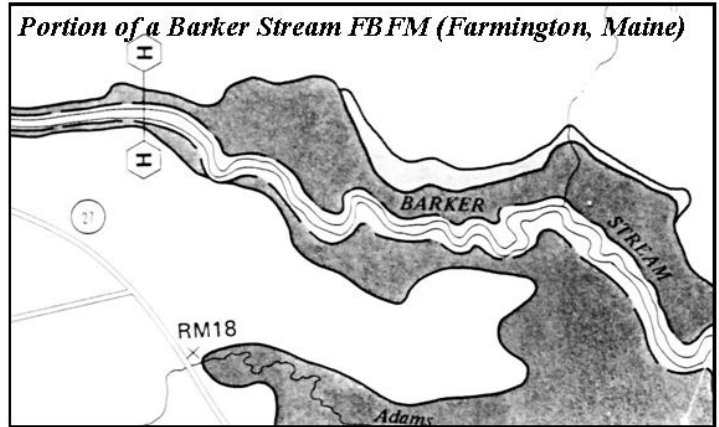
Riverine SFHAs and Floodways

A riverine SFHA is any SFHA subject to overbank flooding from a river, stream, ditch, or other identified channel. It does not include areas subject to flooding from lakes, ponding areas, Zone AO, or coastal floodplains.

Not all areas of riverine SFHA's are alike. The channel and adjacent areas (known as the floodway) convey most of the water during a flood. The water outside the floodway is called the flood fringe. Water moves so slowly in the flood fringe that it is often just stored. An obstruction in the floodway will create a much greater problem than one at the edge (flood fringe), where water may not be moving.

A regulatory floodway is defined in Article XIV of the Maine coastal model ordinances and in Article XIII in the b, c, and d non-coastal model ordinances as:

- a. the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot, and
- b. when not designated on the community's FIRM or FBFM, the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.



Development standards are much more restrictive in floodways because there is greater chance of harm to life or property. If floodway data is available, it must be used to discourage development within the floodway. Development that would result in any increase in flood levels during the occurrence of the base flood discharge is not allowed. If no floodway data is available, then communities must treat the portion of the floodplain that is equal to one half the width of the floodplain as Floodway. See the definition discussed earlier in this section. If an applicant wishes to have a Professional Engineer calculate the floodway width needed to discharge the base flood as provided in the FEMA mapping standards they always have that option.

To help local officials know the location of a floodway, FEMA has conducted floodway studies in some communities. In studies done after 1985, the floodway, if designated, is shown on the FIRM. In studies done before 1985, a Flood Boundary and Floodway Map (FBFM) is provided separate from the FIRM.

A portion of a FBFM is shown here (above right). It is similar to a FIRM, but with some differences:

1. On the FBFM, the floodway is the white area near the river channel bordered by two dashed lines between the gray colored "flood fringe" areas. On maps produced after 1985 the floodway is identified as a cross-hatched area in gray and is shown on the FIRM itself.
2. Cutting across the floodplain are a series of lines, tagged with letters in hexagonal boxes. The letters correspond to the letters on the flood profile in the Flood Insurance Study. In addition, more information is available about these cross section locations on the Floodway Data Table (also in the FIS). A cross section is usually done at each point where the characteristics of the river change.

The Floodway Data Table on the following page provides:

- a) the floodway width,
- b) the cross section area,
- c) the average floodway velocity of the base flood, and
- d) the base flood elevation.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Barker Stream								
A	2,120	159	916	5.1	368.2	368.2	369.1	0.9
B	5,110	56	510	9.2	396.1	396.1	397.0	0.9
C	5,460	111	1,237	3.9	401.1	401.1	401.6	0.5
D	6,095	57	685	7.3	402.9	402.9	403.5	0.6
E	6,405	209	2,338	2.2	403.7	403.7	404.5	0.8
F	14,000	382	3,130	1.9	408.3	408.3	409.2	0.9
G	18,300	221	2,083	2.7	411.8	411.8	412.7	0.9
H	25,335	99	1,092	4.3	423.2	423.2	424.2	1.0
I	34,969	36	279	10.0	510.8	510.8	511.7	0.9
J	36,000	30	241	11.2	533.1	533.1	533.8	0.7
Cascade Brook								
A	2,795	45	374	3.7	353.0	347.2 ²	347.9	0.7
B	3,000	132	1,171	1.2	353.0	350.5 ²	351.1	0.6
C	7,810	48	189	6.5	415.1	415.1	415.4	0.3
D	10,596	76	619	2.0	447.4	447.4	447.8	0.4
E	13,350	103	547	2.3	450.3	450.3	451.3	1.0
F	14,800	121	808	1.3	454.3	454.3	454.9	0.6
G	18,825	45	211	4.5	480.0	480.0	480.3	0.3
Beaver Brook								
A	160	32	231	2.6	357.0	347.4 ²	347.5	0.1
B	2,035	51	272	1.7	357.0	352.7 ²	353.7	1.0
C	2,176	54	362	1.3	357.0	355.3 ²	355.8	0.5
D	2,609	25	104	4.2	357.0	356.9 ²	357.4	0.5
E	2,691	20	113	4.0	360.6	360.6	360.9	0.3
F	2,861	23	149	3.0	368.0	368.0	368.6	0.6
G	3,333	88	1,505	0.3	391.1	391.1	391.2	0.1
H	4,680	197	2,504	0.2	391.1	391.1	391.2	0.1
I	5,755	112	1,230	0.2	394.6	394.6	394.8	0.2

¹Feet above confluence with Sandy River

²Elevation computed without consideration of backwater effects from Sandy River

TABLE 3	FEDERAL EMERGENCY MANAGEMENT AGENCY	FLOODWAY DATA
	TOWN OF FARMINGTON, ME	
	(FRANKLIN CO.)	BARKER STREAM - CASCADE BROOK - BEAVER BROOK

- Perhaps the most important difference between the FIRM and the FBFM is the inclusion of the floodway on the FBFM. The floodplain delineation on the FIRM shows the area covered by the base flood, determined by the base flood elevation. The FBFM has delineations for both the floodplain as shown on the FIRM and the floodway. The delineation of the floodway is based on an analysis of flood flows and is not directly related to ground elevations. Floodways are often developed by use of computer programs. The only way to tell if a property is in or out of the floodway is to scale the proposal on the map using a known reference mark, such as an intersection. If you are not sure, contact the staff at the Maine Floodplain Management Program or your regional council for help.

Reading a Floodway Map

Unlike floodplain boundaries, floodway boundaries are not located by elevation. Floodway dimensions are computed at the cross sections. Engineering judgment is used to draw the boundaries on the map between cross sections. The dimensions at the cross sections are available in the flood insurance study, but elsewhere map scaling is the only method that can be used.

To locate a site on the map: Obtain the distance on the ground between the site and one or more identifiable points (centerline of a street, a bridge, the river channel, a reference mark, etc.). Locate these points on the floodway map. Convert the distances to the map scale and plot the site on the map.

To locate a floodway boundary on the ground: Measure the map distance from one or more identifiable points. Convert these distances to the map scale.

Scaling is, unfortunately, subject to the inaccuracies of the base map used. Keep in mind that the floodway represents that portion of the SFHA required to store and convey the base flood.

CHAPTER II – FLOODPLAIN DATA

Where a floodway has not been identified by an engineering study, use the method found in the definition of "regulatory floodway" found in the Model Ordinance. The Model Ordinance provides for a regulatory floodway, one half the width of the SFHA, adjacent to the river or stream.

F. Coastal High Hazard Areas

Along coastal areas of the state, SFHAs are designated "Coastal High Hazard Areas," and are shown on FIRMs as "V Zones". (See map of coastal Washington County, Maine at right.) A Coastal High Hazard Area is one which will be inundated by the 100-year flood and that has an additional hazard due to wave action velocity.

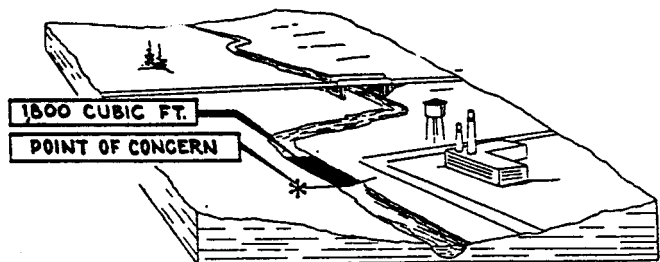
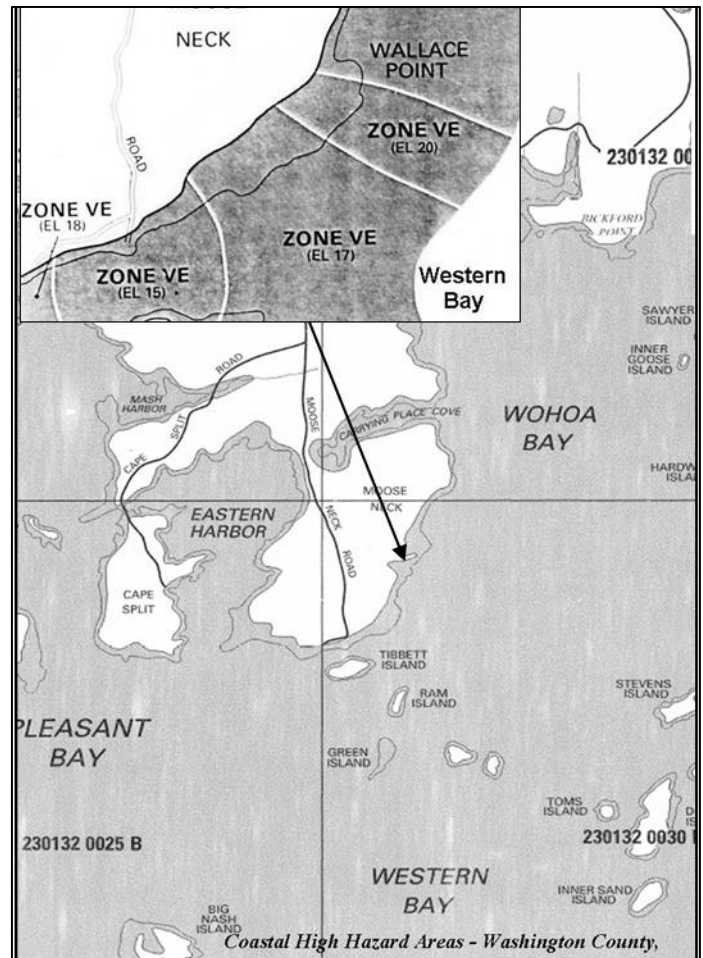
Many of the detailed studies done by FEMA for coastal communities have included engineering calculations to determine wave height and to account for wave run-up along beaches. V Zones are characterized by wave heights of three feet or greater. If the wave height is less than three feet, the area is mapped as an A1-30 or AE Zone. A portion of a coastal FIRM, showing wave run-up heights, is shown below, along with a typical profile of relative water levels in a V Zone.

Stricter regulations apply to construction and substantial improvements within a coastal high hazard area than within other SFHAs. If located within a coastal high hazard area, buildings must be able to withstand the tremendous force of waves and winds, as well as the other effects of flooding. Structures in a V1-30 or VE Zone must meet the standards provided in the Coastal Construction Manual/FEMA 55/June 2000. The CCM is adopted by reference in Maine coastal floodplain management ordinances.

G. Base Flood Studies

In order to accurately predict where the base flood would go, a statistical and engineering study is required for a particular site. Greatly simplified, here are the steps involved in a riverine flood study:

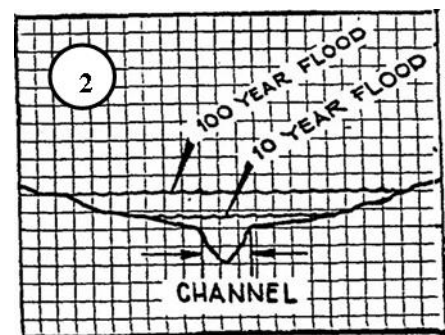
1. The greatest amount of water that would flow during a base flood is calculated. This is called the peak flood discharge and is described as the amount of water passing a point when the 100-year flood is cresting. The discharge is defined in terms of so many cubic feet per second (or "Q") flowing past the point of concern.



The discharge at this point of concern is 1,800 cubic feet per second.

The discharge is calculated by studying rainfall predictions and the drainage area (slope, ground surface, and other factors that affect runoff). On larger rivers, it is computed from stream gage records.

2. The stream channel and adjacent ground area (floodplain) is measured and a cross-section is developed usually by surveying in channel, the sides of the stream or river, and some distance beyond the banks. This requires a certain amount of professional judgment.

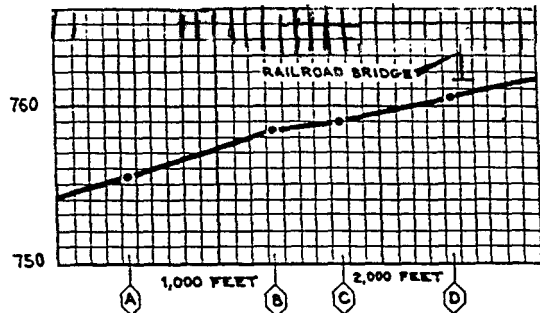


Cross Section: View of a stream channel and adjacent ground area (floodplain)

CHAPTER II – FLOODPLAIN DATA

The cross-section is a diagram that shows how much area is available to carry the peak discharge.

Typically, a computer program is used to feed the discharge through the cross-section. "Roughness" factors are included to account for the landscape's effect that will slow down the flood height (or depth or elevation). A sandy bottom stream will have a different roughness coefficient than one with large boulders or one with a smooth ledge bottom.

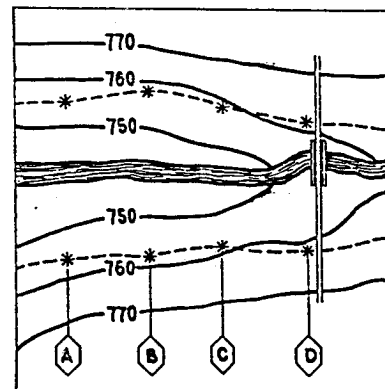


3. For a length of stream, the process is repeated each time the stream or river changes characteristics. A graph is prepared with a straight line connecting the flood elevations at each point. The graph represents a side view or profile of the base flood.

Flood elevations for sites between the studied cross-sections are obtained by reading the profile. Profiles are discussed in more detail later in this chapter.

4. The boundary of the floodplain is mapped. Flood elevations are plotted on a topographic map or some other map that references ground elevations. Lines are drawn connecting these plotted points considering the actual ground elevations.

A FEMA study of base floods is called a Flood Insurance Study (FIS). When the study is completed, FEMA provides a community with a copy of the study results. These include a text, or a booklet that describes the community, its flood problems, and the engineering methods used to determine the floodplain boundary and elevations; flood profile; and a Flood Insurance Rate Map (FIRM). It may also include the Flood Boundary and Floodway Map.



Mapping Floodways

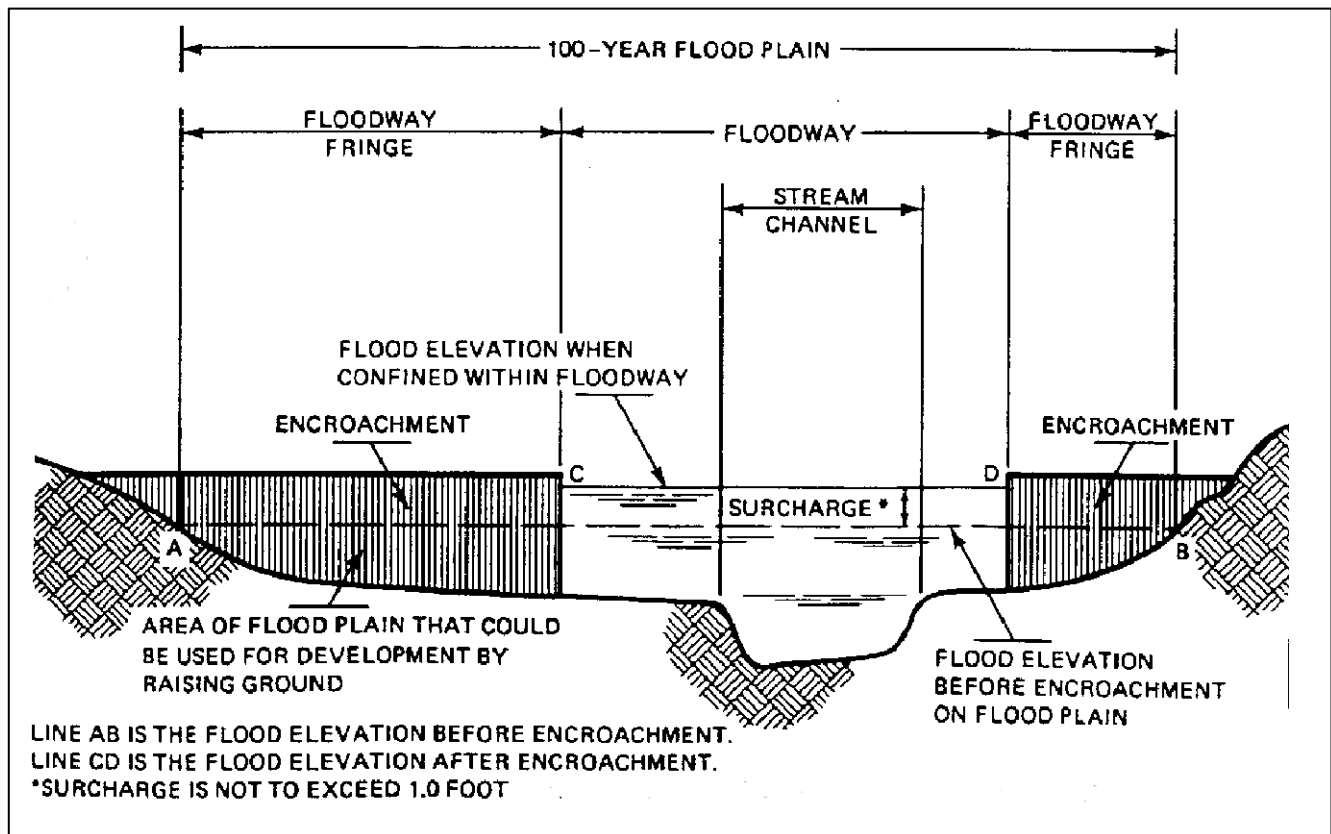
A floodway study in Maine is based on the following legal concepts:

Property owners should be allowed to develop their land provided development does not obstruct flood flows and cause damage to others. The BFE may be increased but not if significant damages would result.

Properties on both sides of a stream must be treated equitably. The degree of obstruction permitted for one must also be permitted for the other. This is called the "equal degree of encroachment rule".

The floodway study is usually done with a computer. At each cross section, hypothetical obstructions are placed at the two edges. The computer assumes the base flood is flowing through the cross section. The obstructions are moved toward the center of the cross section (an equal amount of carrying capacity is taken from both sides) and the computer watches what happens to the flood height. The movement of the obstruction is stopped when the flood level reaches a predetermined increase related to increasing damages (e.g., 1 foot).

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Two lines then mark where the obstruction was stopped. These lines divide the floodplain into three areas: The center area of faster moving water is called the floodway; the two areas of shallow, slow moving, or still water at the edges are called the flood fringe.

Revising Regulatory Floodplain Data

From time to time, communities or individuals may find it necessary for floodplain data to be revised. There are two methods FEMA uses to revise Flood Insurance Rate Maps. One way is to actually revise the map itself - republish the map with the revisions. The second way is to issue a letter that describes the map change. FEMA uses the second method when the revision can be adequately described in writing, saving the taxpayers the expense of republication.

There are five basic reasons a map may need to be changed:

1. Revisions to correct an error: If a map shows streets or municipal boundaries in the wrong location, or if municipal boundaries change, the community should request a map revision and send FEMA a new community map noting the corrections. The state coordinating office should also be notified.
2. Revisions based on better ground elevation data: If a detailed contour map shows errors in the floodplain boundaries, a copy of the more detailed map should be submitted. If the base flood elevation is known (or has been more accurately computed since the map was made), it should be submitted with the revision. Where the best available maps do not clearly show a property higher than the base flood elevation, a certificate of elevation is needed (see Elevation Certificate in Appendix D). The certificate must be sealed by a Professional Land Surveyor or registered professional engineer and must show the elevation of the lowest grade adjacent to the structure and the lowest floor (including basement) of the structure in relationship to the base flood elevation.
3. Revisions based on filling in the floodplain: If there has been a substantial amount of new fill material placed in or near the floodplain to raise building sites to elevate a new structure, a certified "as built" topographic map should be submitted to FEMA after the building has been completed. It should be noted that buildings with basements below the base flood elevation will not have revisions granted. No structure should have been built

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in a mapped floodplain if the lowest floor is going to be below the BFE. It is always advisable to seek a conditional LOMR based on fill prior to the development.

4. Revisions based on better flood data: A FIRM is prepared as part of a Flood Insurance Study and reflects the best data available on the base flood. Parties challenging a FIRM can do so only if the challenge is based on better or more accurate study techniques. The Floodplain Management Coordinator will help communities determine if the challenger's data is better or more accurate.
5. Revision based on new projects affecting the watercourse: A map may be revised to reflect new flood protection measures built since the map was prepared or if a dam has been removed. In rare cases where a stream, river or other water body had been relocated or altered in a way that would change the flood elevations or boundaries a LOMR must be obtained. The NFIP Regulations at 44 CFR Part 65 put the onus on the community for ensuring that the community's flood maps are current and correct. Plans for large projects usually include after-project flood maps that can readily be used to revise a map. However, in most cases a map cannot be changed until the project is actually constructed and/or operating. Furthermore, many small projects, such as one or two retention reservoirs or channel improvements often do not lower the base flood enough to warrant a change in BFE but the community must be certain that the flood boundaries are still correct.

Requesting a Map Revision or Map Amendment

Map change requests are often submitted because a project does not appear to be at risk in a 100-year event.

There are two ways to submit a request. The most frequent procedure is a Letter of Map Amendment (LOMA). LOMAs are intended to provide a method of recognizing structures or parcels that were inadvertently included in a floodplain and, because better contour data is available, to prove the project is clearly not subject to base flood damage. The LOMA process is generally used for a single residential lot or structure. Either the property owner or the community may apply for a LOMA.

The other procedure is called a Letter of Map Revision (LOMR). LOMRs are intended to recognize changes that have occurred since the FIRM was published. Some examples of these changes are typically flood control projects that were constructed after the study was done, new hydraulic or hydrologic data, or better topographic representations. If a property owner believes conditions have changed that warrant an exclusion of his/her property, they must work through community officials.



(Augusta, ME) This riverside gazebo is moveable and can be towed out of the floodplain. Photo from the Maine Floodplain Management Program.

FLOOD FACTS:

- There is a 1% chance of a base flood occurring in any given year, or a 63% chance of occurrence in a 100 year-period.
- During a 30-year mortgage period, there is 26% chance that a SFHA property will be flooded.
- There is only a 4% chance that a fire would affect the property during the same 30-year period.
- The odds of flooding are comparatively high.

CHAPTER III – ACTIVITIES REGULATED

Chapter Summary

All development activity in the SFHA that may increase flood damages, or that may be prone to flooding itself is subject to the regulations of the NFIP. Any activity that could affect the flow of flood water must be reviewed. Local governments can regulate floodplain development activity within their statutory limits. Some of these activities require permits from other local, state and federal agencies before the floodplain development permit can be issued.

A. Development

In order to accomplish the objective of keeping new construction from making flood problems worse, all development activity in the floodplain must be reviewed. The regulatory definition of "development" in the Model Ordinance and the NFIP regulations is all inclusive. Congress established no minimum thresholds for permitting.

Development can be summarized to mean any man-made change to the surface of the earth. It includes but is not limited to buildings, bridges, placement of mobile homes, and fill - obvious potential obstructions to the flow of water. It also includes construction of fences and storage of materials because such activities could catch debris or otherwise dam or divert flood flows.



(Kennebunk, ME) Houses on Intervale Road were flooded during heavy storms in March 2007. In many neighborhoods, it took several days for floodwaters to recede. The homes flooded were not just the pure result of a lot of rain, "development" of the floodplain throughout the Mousam River basin contributed to the increased flooding footprint, Photo by Lance Carpenter, FEMA.

The Flood Insurance Rate Maps developed for communities in the lower reaches of the Mousam River Basin in York County were given to the towns back in the early 1980's. Since that time, more than two decades ago, a lot of development has occurred in communities in the upper part of the basin in towns like Sanford, Acton, Alfred, parts of Lebanon and Lyman, Shapleigh, and Waterboro that has contributed greatly to the increased run off and changes in the way the basin could react to large amounts of rain.

Development, as defined in the Model Ordinance, means any man made change to improved or unimproved real estate, including but not limited to:

1. the construction of buildings or other structures;
2. the construction of additions or substantial improvements to buildings or other structures;
3. mining, dredging, filling, grading, paving, excavation, drilling operations or storage of equipment or materials; and
4. the storage, deposition, or extraction of materials, public or private sewage disposal systems, or water supply facilities.



Rodney Bonney Memorial Park, named in honor of Auburn Officer Rodney Bonney, who lost his life while trying to save a drowning child, was created near the waterfalls of the Androscoggin River near Lewiston. The park is "development," and while its creation did not drastically alter either the topography or the "feel" of the natural landscape it is subject to a permit review. Photo by Lance Carpenter, FEMA.

CHAPTER III – ACTIVITIES REGULATED

It is important to note that the concept of development goes beyond the traditional building permit system most communities have in place. Whereas the building permit is concerned with buildings, the notion of regulating development involves both buildings and alterations to landscape (such as excavation or the use of fill) that might affect flow patterns or the flood carrying capacity of a watercourse. A community's floodplain management program must include the regulation of all improvements or "developments" within the floodplain, not only the construction of buildings and other structures. For permitting purposes, the newly revised Model Floodplain Management Ordinance contained in this handbook now contains a definition for Minor Development.

Theoretically, if a pebble were dropped in a floodplain, it would affect the flow and storage of water. It may border on the ridiculous to require a permit for each solitary pebble placed in a floodplain, but the definition of development in the Model Ordinance does not make exclusions based on size, volume, or dollar value of improvements. On the other hand, we all have better things to do than to monitor pebbles in the river, but it is still important to be mindful that even small things like front porch steps or stacks of firewood can exacerbate flooding problems. By having a permit review for small development a community can mitigate the potential for these problems by requiring that buoyant material be anchored.

B. Statutory Authority to Regulate

The authority for, and restrictions upon a municipality's power to regulate land use in Maine are found in Chapter 187 of Title 30-A. A floodplain management ordinance such as the one adapted from the Model Ordinance is a zoning ordinance and therefore must be consistent with a municipality's comprehensive plan.

In addition, municipal governments are subject to municipal zoning ordinances, and the State is as well where municipal zoning ordinances are consistent with a comprehensive plan that meets statutory requirements. The State may grant itself a waiver where it can be proved that overriding State concerns require that some zoning restrictions be waived. The federal government is not subject to municipal zoning ordinances (Title 30-A MRSA § 4352).

C. Other Activities

Over the years, the Federal Insurance Administration has issued policy statements to clarify what must be regulated and what need not be covered in order to meet the minimum requirements of the National Flood Insurance Program. Here are some summaries:

1. To the limits of its statutory authority, a community must regulate all development. This includes development activities undertaken by the local government itself. For example, because the sanitary district, road commissioner, or public works department usually does not get a building permit, those agencies frequently do not realize that the floodplain ordinance still applies to their projects and requires a development permit.
2. Only development in the Special Flood Hazard Area is regulated; projects outside this area are not covered by the ordinance. Frequently, due to the scale of the map and the lack of a base flood elevation (in an unnumbered A Zone) a Code Enforcement Officer may need to interpret the location of the SFHA boundary. Because a map only shows generally where the SFHA is, the flood elevation must be relied upon to tell if a project is in or out of the SFHA.



Route 109 in Acton, ME after April 2007 flooding.
Photo courtesy of Maine DOT.

Issues such as these are addressed in Article V, Section B of the Model Ordinance. Any development that takes place within the shaded area on the map must have a permit. If the natural elevation of the building site is higher than the base flood elevation (BFE), the project has met the elevation requirements of the ordinance. If the site is above BFE, the applicant should be advised to seek a Letter of Map Amendment (LOMA) from FEMA. (See page 2-14 for further information on revising or amending flood maps.). Until the map is officially amended, the site will still be subject to the federal law that mandates lenders to require the purchase of a flood insurance policy on all structures within the SFHA and the lowest floor must remain above the BFE. Often a property owner thinks that because the natural grade is

CHAPTER III – ACTIVITIES REGULATED

greater than the BFE and is therefore not floodprone, he/she can sink a basement. This is a problem as it relates to the town's administration of the ordinance. If the property is shaded it is still under the auspices of the ordinance and therefore, the lowest floor must be one foot above the BFE. If not, a building with the lowest floor below BFE is considered a violation of the ordinance and a LOMA is very difficult to obtain after the fact.

3. NFIP regulations (and the Maine Subdivision Law) require developers to supply base flood elevation data for large projects such as subdivisions, shown in the Model Ordinance at Article IX, Section D (Article VIII, Section D in the b, c, and d non-coastal models). The Model exceeds NFIP standards in requiring base flood data for all in subdivisions, while the NFIP requires it only for projects exceeding five acres or 50 lots.

The intent of this requirement is to obtain data that can be used by the community to set an accurate base flood elevation for protecting new buildings within the proposed development. If detailed data is not available in the Flood Insurance Study or from the State Floodplain Management Coordinator, the developer must conduct an engineering study to obtain the data.

4. The NFIP mandates minimum property damage protection standards, but not environmental protection or public health regulations. For example, a development project would be permitted if it meets the flood damage protection standards of Articles VI and IX (Article VIII in the b, c, and d non-coastal models), even if the project would destroy a bird nesting area or wetland. (Note: other government regulations such as the Army Corps of Engineers' 404 permits or the state's Natural Resources Protection Act may protect such environments.) Be mindful of the requirement that all permits from other state and federal and even other local permits must be in hand before the Flood Hazard Development Permit is issued – see discussion below in subsection D.

Also, flooded septic tanks do not function well, but they are permitted because they do not cause a flood flow obstruction. Flooding usually does not damage a septic tank, but the tank can create a sewage disposal problem for building occupants during a flood. In coastal environments with strong wave action or even in riverine areas with high velocity, flow can upend a septic tank. That is why they must be anchored. This presents a public health hazard, leading some areas to ban septic tanks in SFHAs. *Maine Subsurface Wastewater Disposal Rules* prohibit disposal areas and septic tanks in the 10-year floodplain.

D. Other Regulations

The NFIP requires local governments to be sure that a developer has all other necessary permits before a floodplain development permit is issued (NFIP Regulation 44 CFR 60.3(a)(2) and Model Ordinance, Article V, Section D). The specific permits required will vary according to the type of project.

As noted above, other state and federal agencies that may have some jurisdiction over some of the floodplain development activities may include:

1. The Maine Department of Environmental Protection (DEP) may have jurisdiction over floodplain developments under any of the following laws or programs:
 - a. DEP provides water quality certification as required by Section 401 of the Clean Water Act and requires permits for any waste treatment systems that discharge to a water body.
 - b. The Natural Resources Protection Act (Title 38 MRSA § 480-A to 480-V) regulates activities over and adjacent to rivers, streams, great ponds, coastal wetlands, sand dunes, and inland wetlands. Activities that require a permit include dredging; bulldozing; removing or displacing soil, sand, vegetation, or other materials; draining or otherwise dewatering; filling, including adding sand or other material to a sand dune; or the construction, repair or alteration of any permanent structure. Generally, a permit is required from the DEP for any activity within 100 feet of a protected resource although some activities are covered by a "permit by rule" procedure. A state or federal agency permit by rule does not exempt the development from a local Flood Hazard Development Permit.
 - c. Site Location of Development Act (Title 38 MRSA § 481 to 490) regulates large development as it relates to ground water and the environment. Activities requiring a permit include: development that occupies a land or water area in excess of 20 acres; drilling for or excavating natural resources on land or under water where the area affected is in excess of 60,000 square feet; mining or advanced exploration activity as defined in the law; structures affecting three or more acres; and subdivisions of five or more lots affecting 20 acres.

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2. Maine Department of Environmental Protection/Department of Conservation/Maine Land Use Regulation Commission have jurisdiction over Metallic Mineral Exploration and Advanced Exploration and Mining (Title 38 MRSA § 349-A).
3. The U.S. Army Corps of Engineers has authority under the
 - a. Rivers and Harbors Act of 1899 (33 U.S.C. §403), sections 9 and 10. Activities under section 9 that need permits include dams or dikes across any navigable (all) waters of the U.S. Section 10 permits are required for the following activities in navigable waters of the U.S.: wharf, dolphin, weir, boom, breakwater, jetty, or groin; bank protection or stabilization activity (e.g. riprap, revetment, or bulkhead); permanent mooring structures such as pilings; aerial or subaqueous power transmission lines; intake or outfall pipes; permanently moored floating vessels; tunnels, artificial canal; boat ramps; aids to navigation; a permanent or semi-permanent obstacle or obstruction; dredging or disposal of dredged material, excavation, and filling, or other modification affecting the course, location, condition, or capacity of navigable waters of the United States.
 - b. Clean Water Act (33 U.S.C. §1344), section 404. This section regulates the discharge of dredged or fill material into all waters of the United States. Activities needing permits include placement of fill that is necessary to the construction of any structure or impoundment requiring rock, sand, dirt, or other material for its construction; site development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills, dams and dikes; artificial islands; property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for structures such as sewage treatment facilities, intake and outfall pipes associated with power plants and subaqueous utility lines; and artificial reefs.
4. U.S. Coast Guard. Activities that need permits include bridges and causeways.

The Code Enforcement Officer should be familiar with the permitting requirements of other agencies and advise permit applicants accordingly.

In administration of the floodplain management ordinance, the CEO must keep in mind that shoreland zoning and any other town-wide zoning still applies. Most water bodies for which a special flood hazard area has been designated will be large enough to be included within a community's Shoreland Zoning Ordinance.



Scene after April 2004 flooding. Photos by the Maine Floodplain Management Program.



CHAPTER IV – PREVENTING INCREASED DAMAGES

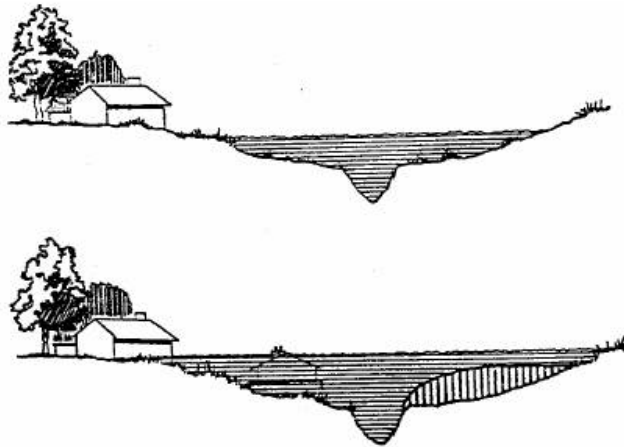
Chapter Summary

Preventing increased flood damage is one of the major objectives of floodplain regulations. Primarily, this means local governments must prohibit any development that obstructs flood flows and increases the risk of damage to the property of others. The area through which most of the flood waters flow is called the floodway.

A. The Problem

The previous chapter addressed the reason why development must be regulated in floodplains: many projects could block flood waters, cause water to rise, or be diverted onto properties that would not otherwise be at risk for flooding.

An example of a cross-sectional view of a floodplain to the right shows how much area is available for carrying the base flood discharge. When part of the area is taken up or obstructed, the discharge still needs roughly the same amount of area. The result is that the flood must go higher. Another way to think of it, is when you get into a bathtub with water in it, your body displaces the volume of water and causes the water level to rise. It is the same thing with a river basin. It is just like a big bathtub.



One of the key purposes of floodplain regulation is to prevent construction projects similar to those that have created problems in the past. This is done by withholding the development permit until the project plans are reviewed to ensure that there is no obstruction to flood flow, increases to flood heights, or increased flood damages being created.



(Augusta, ME) Commercial areas in older towns are often located on rivers. Floodproofing is an option for commercial buildings. Photo by Maine Floodplain Management Program.

Recall from Chapter III the pebble that could theoretically affect the flow and storage of flood water. Preventing such pebbles would be unfair and absurd. There must be a definition of obstructions to flood flow that would exempt pebbles. Our objective is not to prohibit the use of floodplains. Rather, the use of floodplains that cause "injury" or "damage" to others is prohibited. This concept is the first objective of the regulations and it guides the flood damage protection standards of Article VI of the Model Ordinance.

The legal system requires that regulations be fair and reasonable, and that all property owners be treated equitably. If one property owner is allowed to raise flood heights by a small amount, other owners in a similar situation must be given the same permission. While such action on the part of the first owner would not cause damage, the cumulative effect of similar actions would cause damage. As such, none may be allowed.

CHAPTER IV – PREVENTING INCREASED DAMAGES

A zero increase may not be a desirable standard because a strict legal reading of it would prohibit even the pebble. However, some states have adopted the zero rise standard. The NFIP requires that encroachments within the floodway be permitted only when it is demonstrated, by means of an engineering analysis, that the proposed development, when combined with all other existing development and anticipated development, will not increase the water surface elevation of the base flood by more than one foot.

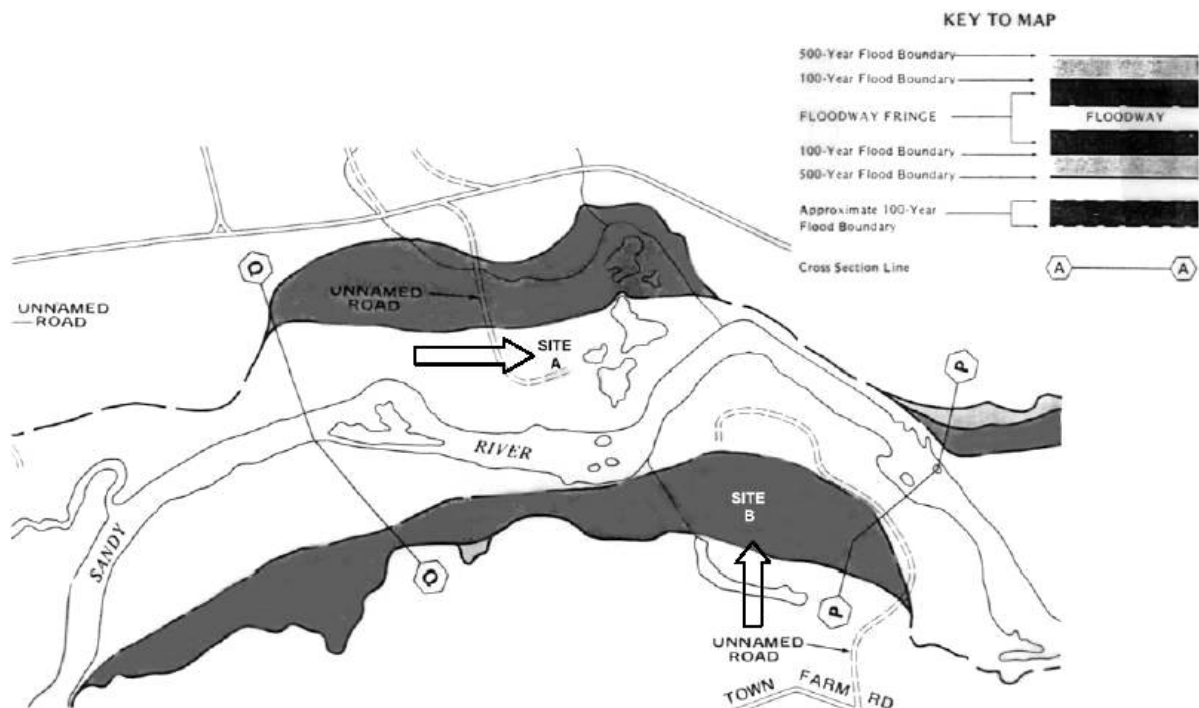
B. The Floodway Concept

As has been discussed, it is challenging to assess the impact that any given project will have on development during the permit application process. It can be difficult and expensive to determine the project's impact on flood heights, particularly when future developments must be considered. In an effort to reduce the regulatory burden on a community or property owner and as part of the Quid Pro Quo, the federal government has financed such calculations in those areas where development is most likely to occur. These calculations are part of the floodway analysis in the Flood Insurance Study and they result in the development of a Flood Boundary and Floodway Map in older studies and are part of the floodway determination on the FIRMs in the studies typically done after 1985 and '86 (as described in Chapter II). In the State of Maine when a floodway study has not been done, the floodway is assumed to be one half of the width of the SFHA, adjacent to the stream or river.

Development Outside of the Floodway

Once a floodway is delineated, the job of the floodplain regulator is greatly simplified. When a permit application is submitted, the community permitting official checks the site location in relation to the floodway boundaries. If the site is in an identified fringe (in other words, outside of the floodway), the official knows the development will not cause flood damage to others: the floodway study already calculated that fringe obstructions will not cause a significant increase in flood heights. (NOTE: this does not mean that the development will not create a localized drainage problem, only that it will not block the flow of waters from flooding of the stream or river that was studied).

Project Site A: In Floodway
Project Site B: In Flood Fringe



Development in the Floodway

CHAPTER IV – PREVENTING INCREASED DAMAGES

Development is not completely prohibited in a floodway, however, development that restricts the discharge of the base flood is prohibited. The regulations assume that fringe owners can and will completely fill or otherwise develop the flood fringe areas. Therefore, any obstruction in the floodway could cause the base flood to rise above that previously determined permissible amount (e.g. more than one foot). The result would be the creation of damages to others - a violation of one of the purposes of the regulations and contrary to Maine law.

Because the community's flood map has already taken into account the maximum rise of one foot, to minimize the potential for unlawful obstruction, community guidelines must require that the developer of a project located in a floodway obtain an engineering assessment indicating that the project will not cause any rise in the flood elevation. The assessment must take into consideration existing and planned development. This requirement is specified in Article VI, Section K.1. of the Model Ordinance as shown in chapter one of this handbook. In SFHAs for which no regulatory floodway has been designated on a FHBM or FIRM, Article VI, Sections K.2. and K.3. apply – see discussion in the next paragraph.

Development Where No Floodway is Mapped

In a riverine community wherein the SFHA has not been mapped, the floodway must be assumed to be the area adjacent to the stream or river, which is one half of the width of the SFHA. If a community has a significant potential for development in these types of riverine SFHAs, they may consider asking FEMA to prepare a detailed study to identify that portion of the riverine SFHA considered as the floodway. There is always the option that a community can fund its own study provided it meets the technical mapping standards established by FEMA. These studies are expensive and with the limited funds both at the state and federal level, there must be a strong justification for such a request. The State Floodplain Management Coordinator is available to assist communities in preparing such a request.

C. Hazardous Materials



*Canton, ME Flood December 18, 2003
Caution should be exercised when working near a damaged tank.
Such a structure may be particularly hazardous when it has been
loosened from its anchor during a disaster. Photo by Lou Sidell,
Maine Floodplain Management Program.*

Increased flood height is not the only potential flood-related hazard that can result from floodplain development. Although Article VI of the Model Ordinance does not prohibit the placement of chemicals, explosives, buoyant materials, or other hazardous materials below the flood protection elevation, a community should take steps to assure that places that store or use hazardous material are properly mitigating flood damages either by using floodproofed storage facilities like tanks or in places otherwise protected. It may be wise to completely prohibit such materials in the SFHA. From the U.S. Corps of Engineers book, *Floodproofing Regulations*, two lists of examples have been developed:

CHAPTER IV – PREVENTING INCREASED DAMAGES

1. Items that are extremely hazardous or vulnerable to flood conditions that should be prohibited from the SFHA:

Acetone
Ammonia
Benzene
Calcium Carbide
Carbon Disulfide
Celluloid
Chlorine
Hydrochloric Acid

Hydrocyanic (Prussic) Acid
Magnesium
Nitric Acid
Oxides of Nitrogen
Phosphorus
Potassium
Sodium
Sulfur

2. Items that are sufficiently hazardous or vulnerable to require their prohibition in all spaces below the base flood elevation or the elevation of flood protection:

Acetylene gas containers
Drugs (in quantity)
Food products (potential health problems)
Gasoline
Charcoal, coal dust (subject to spontaneous combustion when wet)
Matches and sulfur products (in quantity)

Petroleum products
Soaps and detergents (in quantity)
Tires (open storage)
Wood products (in quantity)

Other hazards to be cautious of are storage tanks, lumber, and similar buoyant materials. If not properly anchored, these items can become floating debris that will abut buildings or bridge openings downstream causing blockage of flood flows and increased flood heights.



*Hallowell April 2005, LP tanks not anchored and susceptible to flow.
Photo by Bonnie Cowle, Maine Floodplain Management Program*

FEMA has produced a CD that addresses the proper installation of LP and home heating oil tanks titled *Anchoring Home Fuel Tanks*, A Presentation of FEMA's Mitigation Division, FEMA 481. Contact the state coordination office or FEMA for a copy.

Wells, Maine: A home heating oil tank in an AO Zone that is adequately anchored to prevent floatation and lateral movement. Photo by Lou Sidell, Maine Floodplain Management Program



CHAPTER IV – PREVENTING INCREASED DAMAGES

Pollution

Article VI, Section C of the Model Ordinance is designed to prevent both pollution from and flooding of sewer lines (which usually results in flooded basements) and subsurface wastewater disposal systems. Manholes can be watertight or elevated above the flood protection elevation. Although there is no way to make a septic system leach field watertight, septic tanks can be made substantially watertight with backflow prevention techniques and they must be adequately anchored. In Maine, the Department of Health and Human Services, Division of Environmental Health is responsible for the regulation of onsite disposal systems.

Manufactured Housing

A manufactured home is susceptible to being washed off its foundation, carried downstream and causing significant damage to other properties.

Article VI, Section H of the Model Ordinance requires that manufactured housing units be elevated on a permanent foundation at least one foot above the BFE. **Whereas permanent foundations cannot be placed within a floodway without causing an increase in the flood elevation, the NFIP does not allow manufactured housing in floodways.** The NFIP does not apply this regulation to the placement of mobile homes in **existing** mobile home parks

(those that were there before a community joined the NFIP). However, the Model Ordinance does regulate against the placement of homes in floodways in existing parks.



(Canton, ME) Manufactured homes such as this one are particularly susceptible to the ravages of extreme weather. The ice jam flooding December 18, 2003, on the Androscoggin River set the stage for widespread community flooding. The oil tank on page 4-3 of this chapter belonged to this home. Note that the steps were also washed away. The flood depth was up to the second board above the skirting or just above the door sill. Photo by Lou Sidell, Maine Floodplain Management Program.

foundation that is secured in one of the following ways: poured masonry slab or foundation walls; with hydraulic opening; or reinforced piers or block support. The foundation must support the home so that its wheels and axles are not weight-bearing. For additional information see— *Manufactured Home Installation in*

Flood Hazard Areas/FEMA 85
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CHAPTER V – PROTECTING STRUCTURES

Chapter Summary

The NFIP requires that new structures in floodplains be constructed in a way that will mitigate future flood damages. Three primary methods provide this protection:

- 1) elevation on fill;
- 2) elevation on stilts, pilings, crawl space, or other appropriate foundation; and
- 3) floodproofing (allowed only for nonresidential structures).

Small additions, repairs or improvements now have minimum standards that apply. However, any "substantial improvement" must meet the elevation or floodproofing standards of the ordinance just like new construction. *Substantial Improvement* is defined as any repair, reconstruction, or improvement of a structure, the value of which equals or exceeds 50% of the market value of the structure.

A. Structures

The term "structure" is defined in the Model Ordinance and NFIP Regulations as a building with walls and a roof. In addition for floodplain management purposes, above ground storage tanks are considered structures. The definition of a structure is primarily limited to buildings -- for these three reasons:

1. They are the most important, most valuable, and most common man-made structures subject to flood damage. Floodplain regulations are intended to prevent flood damage.

They are usually occupied by or used by people. Protecting them protects human life and health and reduces human suffering.

2. Buildings and their contents are the only things covered by an NFIP flood insurance policy. Protecting them reduces flood insurance claims.

These reasons should be kept in mind when deciding whether a development project qualifies as a *structure*. For example, a mobile home fixed to a foundation is considered a *structure* for regulatory purposes, but a travel trailer is not, unless it is left on the site for more than 180 consecutive days per calendar year.

Gas and liquid storage tanks are included in the definition of structures for flood damage prevention purposes.



Elevated home in Georgetown, Maine. Photo by Bonnie Cowle, Maine Floodplain Management Program

Structures that are not enclosed are not insurable. These would include carports, open pavilions and tents. Buildings with at least two solid walls and a roof that are fully secured, however, are insurable (and do qualify as a *structure* for regulatory purposes). Contents coverage in these types of buildings is provided only if the contents are secured to prevent flotation out of the building during flooding.

Remember that *development* is defined as any change to real estate including mining, dredging, filling, grading, paving, excavation, storage or deposition of materials. There are many activities which will count as *development*, yet are not *structures*. All *development* must meet the requirements of Article VI, Section A of the Model ordinance. However, only developments which qualify as *structures* have to meet the protection requirements of Article VI, Sections F, G, H, L or P.

CHAPTER 5 – PROTECTING STRUCTURES

The Model Ordinance does not require that small additions to structures be elevated providing that the market value of the building is not increased by more than 50%. It should be noted that a larger addition or a *substantial improvement* to a house could be permitted, if that addition meets the regulatory standards of the ordinance. For example, if a building is being completely remodeled or reconstructed, and if that work would increase the market value of the building by 50%, then the building must meet the elevation or floodproofing standards outlined in Article VI of the Model Ordinance. The ordinance still requires that small additions and other minor development be reviewed through the Flood Hazard Development Permit process.

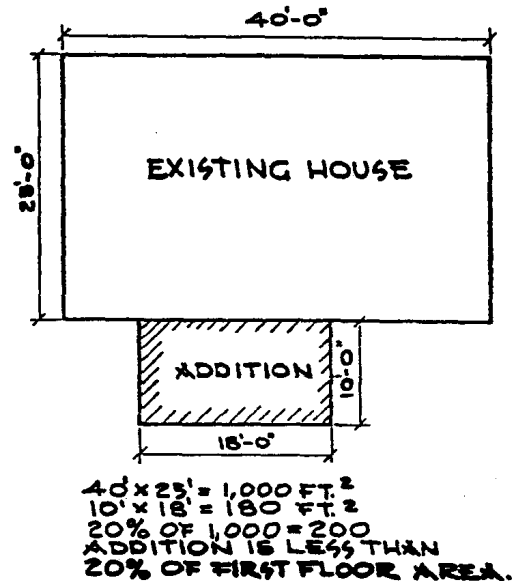
B. The Flood Protection Elevation

The NFIP requires that any new building or *substantial improvement* be constructed in such a manner as to protect it from flood damage in the event of a base flood. This also applies to a *substantially damaged* building that is being reconstructed. This is accomplished by elevating or floodproofing a building to the Flood Protection Elevation (FPE). The FPE is defined as the base flood elevation plus some margin of safety. This margin of safety is called "freeboard".

Freeboard compensates for additional hazards or unpredictable factors that accompany the base flood. These include wave action, downstream obstructions, ice jams, damage to floor joists, and statistical variability in base flood elevation calculations. Although the NFIP does not require any freeboard, in Maine there is a one foot freeboard requirement.

Many communities across the state have chosen to require a two foot freeboard. Since 1986, the State Subdivision Law has required a freeboard of one foot in all buildings in a subdivision.

In addition to the need for a margin of safety, freeboard is economically justifiable for the owner: the extra protection will save the owner from flood damages and will lower insurance premiums. The NFIP Regular Program insurance premium rating tables that follow show the difference in rates for buildings with their lowest floors above or below the base flood elevation (BFE).



INSURANCE RATING EXAMPLE* May 1, 2007 Preferred Risk Policy-Building and Contents Combination

		Coverage			Annual Premium
No Basement/Enclosure		\$75,000/\$30,000			\$207
With Basement/Enclosure		\$75,000/\$30,000			\$232
No Basement/Enclosure		\$150,000/60,000			\$264
With Basement/Enclosure		\$150,000/60,000			\$295

CHAPTER 5 – PROTECTING STRUCTURES

Standard B,C, And X Coverage-Building and Contents Coverage

		Coverage	ICC	Fed Fee	Annual Premium
No Basement/Enclosure		75,000/30,000	6	30	\$690
With Basement/Enclosure		75,000/30,000	6	30	\$794
No Basement/Enclosure		150,000/60,000	6	30	\$931
With Basement/Enclosure		150,000/60,000	6	30	\$1113

Standard B,C and X Coverage – Building ONLY

		Coverage	ICC	Fed Fee	Annual Premium
No Basement/Enclosure		75,000	6	30	\$439
With Basement/Enclosure		75,000	6	30	\$509
No Basement/Enclosure		150,000	6	30	\$581
With Basement/Enclosure		150,000	6	30	\$711

Post FIRM Construction

Constructed after community entered regular program. \$100,000. Single family - elevated floor–Zone AE

1st Floor Elevation	First \$50,000	Over \$50,000	ICC	Fed Fee	Annual Premium
3 ft above BFE	\$.24 per \$100	\$.08 per \$100	\$6	\$30	\$ 196
2 ft above BFE	\$.37 per \$100	\$.08 per \$100	\$6	\$30	\$ 261
1 ft above BFE	\$.67 per \$100	\$.08 per \$100	\$6	\$30	\$ 411
0 ft at BFE	\$1.31 per \$100	\$.10 per \$100	\$6	\$30	\$ 741
1 ft below BFE	\$3.31 per \$100	\$ 1.21 per \$100	\$6	\$30	\$2296
2 ft below BFE**	\$3.50 per \$100	\$1.44 per \$100	\$35	\$30	\$2535
3 ft below BFE**	\$3.70 per \$100	\$1.82 per \$100	\$35	\$30	\$2825
5ft below BFE**	\$7.41 per \$100	\$3.95 per \$100	\$35	\$30	\$5745

AO, AH Zone Construction

Constructed after community entered regular program. \$100,000.

	First \$50,000	Over \$50,000	ICC	Fed Fee	Annual Premium
With Elevation Cert.	\$.25 per \$100	\$.08 per \$100	\$6	\$30	\$201
Without Elevation Cert.	\$.85 per \$100	\$.19 per \$100	\$6	\$30	\$556

Manufactured (Mobile) Homes

Typical manufactured home in existing manufactured home park - \$60,000 coverage. Zone AE

1st Floor Elevation	First \$50,000	Over \$50,000	ICC	Fed Fee	Annual Premium
2 ft above BFE	\$.37 per \$100	\$.08 per \$100	\$ 6	\$30	\$ 229
1 ft above BFE	\$.85 per \$100	\$.09 per \$100	\$ 6	\$30	\$ 470
0 ft at BFE	\$2.03 per \$100	\$.10 per \$100	\$ 6	\$30	\$1061
1 ft below BFE**	\$2.87 per \$100	\$1.18 per \$100	\$ 6	\$30	\$1589
2 ft below BFE**	\$3.01 per \$100	\$1.23 per \$100	\$35	\$30	\$1693
3 ft below BFE**	\$3.97 per \$100	\$1.63 per \$100	\$35	\$30	\$2213

Commercial

Small Business; one floor - \$150,000 coverage. Zone AE

1st Floor Elevation	First \$150,000	Over \$150,000	ICC	Fed Fee	Annual Premium
1 ft above BFE	\$.46 per 100	\$.10 per \$100	\$6	\$30	\$ 726
0 ft at BFE	\$1.18 per 100	\$.20 per \$100	\$6	\$30	\$1806
1 ft below BFE	\$4.67 per \$100	\$1.35 per \$100	\$6	\$30	\$7041

Structures Not in Special Flood Hazard Area (Pre & Post FIRM)

\$100,000 policy Single Family; \$60,000 policy Manufactured Home. – Zones B, C, X

***These tables are examples only and are not to be used for actual rating purposes. For single family dwellings and manufactured homes, these examples do not include a basement or enclosure.**

**** Can be higher depending on how risk exposure is reviewed by FEMA**

	First \$50,000	Over \$50,000	ICC	Fed Fee	Annual Premium
Single Family	\$.71 per \$100	\$.19 per \$100	\$6	\$30	\$486
Manufactured Home	\$.71 per \$100	\$.34 per \$100	\$6	\$30	\$425

C. How Floods Damage Buildings

It is important to understand how floods damage buildings, so that new construction can be built in order to avoid damage or minimize flood damage. A flood can directly damage a building in three ways:

1. Hydrostatic pressure: The lateral pressure of standing water can push over walls or windows. Hydrostatic pressure increases as water gets deeper (higher). Once the ground under a building is saturated, water tries to seek its own level. Hydrostatic pressure from underneath is known as uplift and can crack a concrete floor or even float a wood frame house.
2. Hydrodynamic forces: The effects of current, waves, and floating debris can batter down a wall.



(Brunswick, ME) The spring 2007 storms that pummeled Knox County significantly damaged this home. Photo by Lance Carpenter, FEMA.

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Hydrodynamic force increases with the water's velocity (Mean floodway velocity is listed in the Flood Insurance Study's Floodway Data Table. See table on page 2-9.) When the velocity of a riverine flood is greater than five feet per second, the floodway can be considered a "high hazard" area and should be avoided. Along the coast, in areas designated as V Zones, the force of storm waves can destroy buildings with little effort. The effects of ice floes and tree trunks can be so great that the State Planning Office recommends that no structures be allowed in high hazard areas subject to these dangers.

3. **Wetting:** Contact with water can warp, decompose, or otherwise ruin certain materials. Especially damage-prone are wood and wood products, drywall, insulation, carpeting and most furniture and contents.

D. Protecting Against Flood Damage

General

The Maine floodplain management standards are such that residential buildings must have their lowest floor elevated to at least one foot above the base flood elevation. Non-residential structures may be elevated or floodproofed. There are different ways of meeting the elevation standards for elevating a structure.

Elevation on Fill

Outside of the floodway, fill was once considered one of the best ways to protect a building against flood damage. While this is a very effective way to protect a structure, the value of the floodplain is reduced when large amounts of fill are introduced into the area that would normally be flooded. Fill removes flood storage. The overall effect of allowing fill at many sites in a community will ultimately result in raising the base flood elevations.

In some cases, however, fill is the best alternative. Fill for the purposes of construction should be what is commonly referred to as engineered fill. It would be foolish to construct a new building on a pile of fill only to have the soil settle under the weight of the building and cause structural failure. It is also imperative to stabilize or protect the fill from erosion. An engineering standard that must be followed is that the fill must be

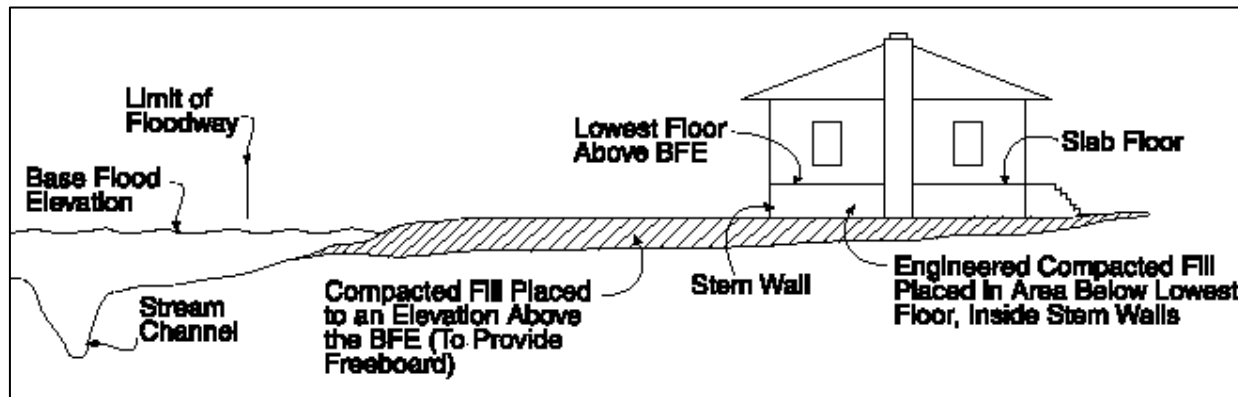


Diagram showing the utilization of stem walls when building on fill. From *FEMA Technical Bulletin construction FIA TB-1 10-1* compacted to 95% of the maximum density obtainable with the Standard Proctor Test.

Fill slopes for granular material may not be steeper than one vertical on one and one-half horizontal. Slopes exposed to flows with velocities of up to five feet per second (fps) during the 100-year flood must, at a minimum, be protected by a permanent cover of grass, vines, weeds, or similar vegetation; slopes exposed to velocities greater than five fps during the 100-year flood must, at a minimum, be protected by appropriately designed stone, rock, or other durable products.

Note that when a building site is filled, it is still considered to be in the Special Flood Hazard Area, and **no basements are permitted**. As specified in Article VI of the Model Ordinance, the building's lowest floor must be at least one foot above the BFE. The elevation of the floor is measured from the top of the floor in A1-30, AE, AO, AH, and A Zones. Using fill as a means to elevate a building is only allowed outside of a floodway and in flood zones A1-30, AE, AO, AH, and A. Fill in AO and AH zones must include drainage paths around the structure.

Note that in AO zones the elevation requirements are controlled by the flooding depth and not by a base flood elevation as we find in the other Special Flood Hazard Areas. AO zones are areas of sheet flow where the

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flood waters typically flow over a site in a consistent depth, usually one to three feet deep. The flood protection measure is from the **highest adjacent grade**. If the building site is on a sloping grade, the measurement is taken from the highest point where the building footprint meets the ground. The entire building footprint is regulated by this one elevation. A building cannot be “stairstepped”. Not only does the lowest floor have to be elevated to at least one foot above the highest adjacent grade, but the utilities, such as the furnace and electrical service panel also need to be elevated above the lowest floor.

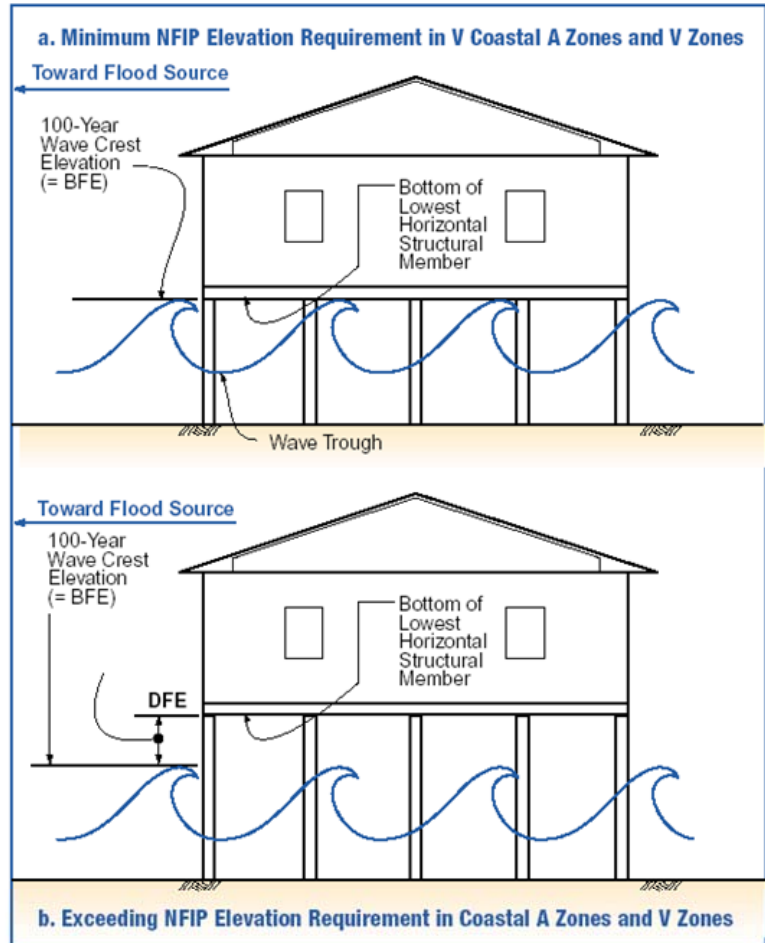
Fill is not allowed for structural support in V1-30 and VE Zones. In coastal velocity zones, V1-30 and VE, buildings must be elevated on open foundation systems such as piers, columns, or posts. So-called shear walls (two parallel walls open at both ends) are considered a truly open foundation system. See *FEMA's Technical Bulletin 5-93 Free-of-Obstruction Requirements*. In addition, the elevation of the lowest floor is measured from the lowest horizontal member in V Zones. The diagrams below show the construction requirements in select coastal V Zones (from FEMA Publication 55CD, **Coastal Construction Manual**, third edition).

Elevated Foundation

Elevation of a building on stilts, piles, walls, crawl space or other support is a well-recognized technique to avoid flood damage by locating all damageable parts of a building one foot above the BFE. When using this method, there are two major concerns:

1. to ensure that the supporting members can resist the three effects of flooding; and
2. to ensure that the building is properly rated by the NFIP flood insurance rating system.

Many times an NFIP rating technically defines the lower area of an elevated building as the “lowest floor” and the owner is unpleasantly surprised with the high flood insurance premium for a building intended to be free from flood damage. Conversely, buildings that are seemingly damage-resistant may include lower area levels that were converted to finished rooms that are highly susceptible to damage. Therefore, it is important that the design of an elevated foundation consider the factors addressed below.



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Protection from Hydrostatic Pressure

Ensuring Free Flow of Water

The best way to prevent buildup of hydrostatic pressure is to maintain the area below the lowest floor open for the free flow of flood water by not converting it to habitable space, either at the time the structure is built or at some future point. However, the owner may want to enclose the lower area to protect against animals or vandalism. This can be done with screening or open lattice work.

Extra precautions must be taken if a home owner wants to protect the lower area from heat loss and rain. When this area is enclosed with block walls, they should be reinforced with steel bars to tie the footing to the sill. Specific guidance is available from the Army Corps of Engineers or FEMA.

To ensure that the enclosure will not result in hydrostatic pressures on the walls, the lower area must have a minimum of two permanent openings (such as grates or cinder blocks turned sideways) on different walls of each enclosed area. The bottom of the openings must be no more than one foot above grade and have a net area of at least 1 square inch for each square foot of lower floor area. If flood heights could rise to within two feet of the lowest floor, air vents must be installed. Further guidance can be found in the FEMA Technical Bulletin, TB 1-93, *Openings in Foundation Walls*.

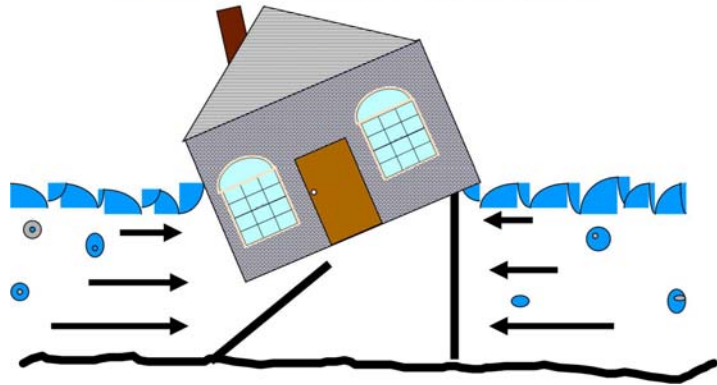
As an option to having permanent openings, a cover such as plastic sheeting may be taped on the inside of the openings to prevent passage of air. Any cover must operate automatically; it cannot depend on a person being around to open it or require electrical or mechanical assistance (i.e. there can be no "human intervention" or "electrical dependency"). If it depends on water pressure to push it open, a cover cannot be nailed or otherwise securely fastened down nor can it be placed on the outside of the building. The floor of the lower area must be at grade on at least one side. Any floor that is below grade on all sides will be defined as a basement by the flood insurance rating system.

Protection from Hydrodynamic Pressure

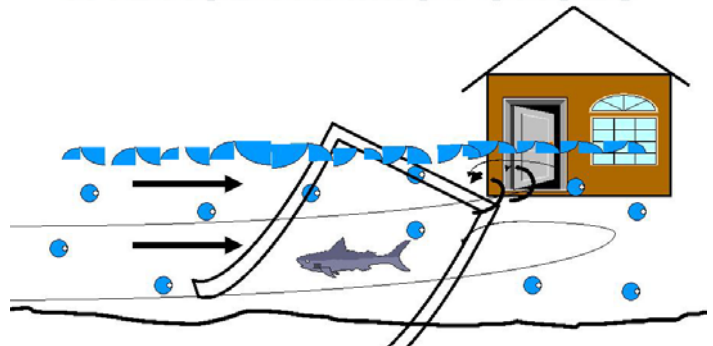
Anchoring Supporting Structure

The foundation and supporting members must be anchored and aligned parallel with the direction of flow to present the least obstacle to flood waters. In areas of low velocity and shallow flooding, normal building practices can handle hydrodynamic pressure. Most building codes include a requirement to anchor window sills to the foundation. This standard is generally sufficient to protect a building that is subject to flood depths of less than three feet, and buildings exposed to lower flood velocities. Given the serious nature of potential flood damage, the code enforcement officer should ensure that both the studs and the sill are properly anchored according to code.

HYDROSTATIC FORCES



HYDRODYNAMIC FORCES

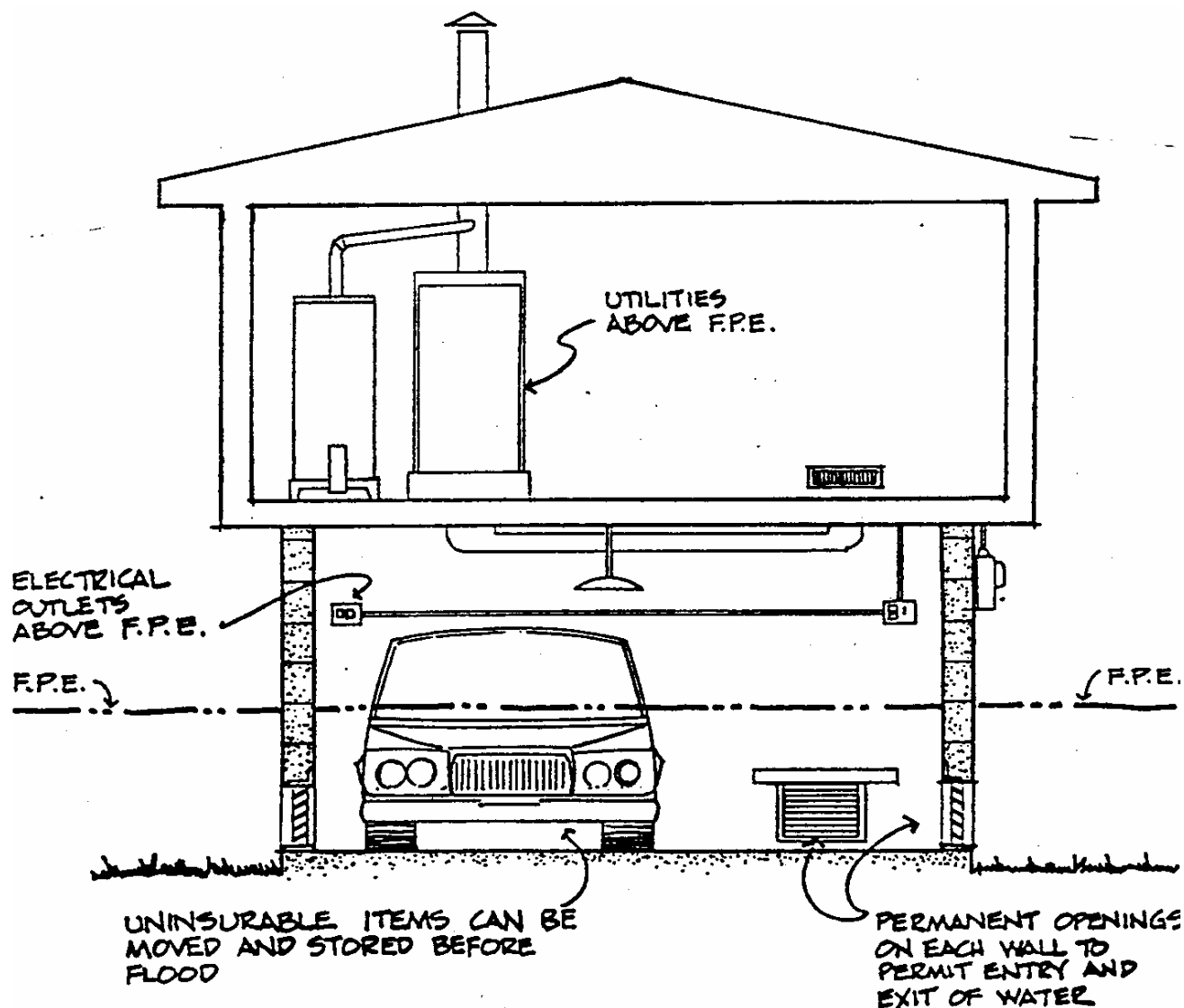


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Open Support

Where riverine floods have high velocities, or where flood flows should not be obstructed, a building should be elevated on open supports such as pilings or open lattice walls. This allows flood waters to flow freely under the building causing no pressure or danger of collapse of the supports. This technique should be used when the flood insurance study's Floodway Data Table lists the average floodway velocity as greater than five feet per second, and in all coastal high hazard areas (V zones).

If debris is present, the supports need to set apart to minimize the chance of creating dams. If there are coastal high hazard areas, the FPE should have enough freeboard to ensure that the lowest floor will be above them and the supports should be adequately braced to withstand battering. In areas subject to ice jams, the average builder would not be likely to be able to reinforce supports enough to resist ice pack pressure. If a code enforcement officer is unsure whether a structure will resist potential forces, an engineer's certificate similar to the one required in Article VI.G.1.c. must be required.



CHAPTER 5 – PROTECTING STRUCTURES

Flood Damage Resistant Materials

The area below the FPE must be unfinished and remain free of water damage. This requires the use of materials resistant to flood damage. FEMA Technical Bulletin, TB 2-93, *Flood Resistant Materials Requirements*, is very helpful in understanding what materials are acceptable in an area that may get inundated. Following is only a partial list of materials that can be considered flood damage resistant.

Brick, face or glazed	Epoxy, formed-in-place	Silicone
Cast stone in waterproof mortar	Glass	Steel with waterproof applications
Cement/bituminous	Glass blocks	Stone: non-absorbent natural or artificial
Cement/latex	Insulation, foam or closed cell types	with waterproof grout
Clay tile, ceramic veneer	Metal	Terrazzo
Concrete	Paint: polyester-epoxy and other	Vinyl asbestos tiles with asphaltic adhesives
Concrete block	waterproof types	
Concrete tile	Polyurethane	

Wood, if properly treated for water damage by pressure preservative treatment, can also be used as a flood resistant construction material. The professional organizations which have tested wood products make the following recommendations:

American Wood Preservers Bureau (AWPB) mark "LP-22": acceptable for ground or fresh water contact.

American Wood Preservers' Association (AWPA) mark "C-2": acceptable for flood prone areas.

American Plywood Association (APA) stamp "Rated Sheathing Exposure 2": exterior type plywood acceptable for flood prone areas.

Projects constructed with pressure treated wood will last longer if hot-dipped galvanized or stainless steel fasteners are used. Conventional nails and fasteners may corrode, resulting in unsightly rust stains or separation of the wood or may in extreme cases result in structure failure because the fasteners have been weakened. See FEMA Technical Bulletin, TB 8-96, *Corrosion Protection for Metal Connectors in Coastal Areas*.

No machinery, electrical equipment, etc. may be located below the FPE. Electrical wiring and outlets, air conditioners, furnaces, gas fixtures, and similar equipment may be suspended from the ceiling or walls or elevated on pedestals in the lower area, provided that they are still above the FPE.

Protection of Contents and Prohibition of Alteration

It is important that the occupant be prohibited from exposing insurable items to flooding in an area below an elevated floor. This means keeping damageable contents out of harm's way and prohibiting the lower area from being altered to become habitable. When the permit is issued, the owner should be advised in writing that:

- a. While the lower area may be used for parking of automobiles or storage of tools or other items, a flood insurance policy will not cover any contents below the elevated floor, and
- b. Any changes such as installing paneling or carpeting may void flood insurance coverage.

One additional note of caution is to be extremely diligent in ensuring there are no "rough ins" for plumbing fixtures during the initial construction. This has been a problem in other southern states and has led to homes being finished off after the CEO has issued the certificate of occupancy.

Elevation of Manufactured Housing

Placement of manufactured housing in the SFHA must be regulated like any other structure.

A development permit must be issued and the manufactured housing must be elevated so the floor is at or above the FPE. The Model Ordinance applies this elevation standard to all manufactured housings placed in the SFHA (including those in a mobile home park or a single lot). The Maine Department of Human Services

CHAPTER 5 – PROTECTING STRUCTURES

has some regulations that apply to mobile home parks. However, these flood protection requirements must be enforced locally. The state licensing regulations do not preempt local floodplain regulations. NFIP has very specific tie down requirements (as listed in Article VI.H.1.b. of the Model Ordinance). The tie-down requirements apply to all manufactured housing in the SFHA.

Floodproofing

Dry floodproofing is allowed for use only for nonresidential structures (Model Ordinance Article VI.G.).

Dry floodproofing means making the building watertight and structurally strong enough to resist the three direct hazards of flooding. It is very difficult and expensive. Because of the technical expertise required, the Model Ordinance and the NFIP require the applicant to demonstrate that the building is properly designed by a registered professional engineer or architect (Model Ordinance Article VI.G.1.c.). Further guidance can be found in the FEMA Technical Bulletin, TB 3-93, *Non-Residential Floodproofing - Requirements and Certification*. Local engineers and architects can use the Corps of Engineers' book *Flood Proofing Regulations* as a guide on how to meet the ordinance's performance standard.

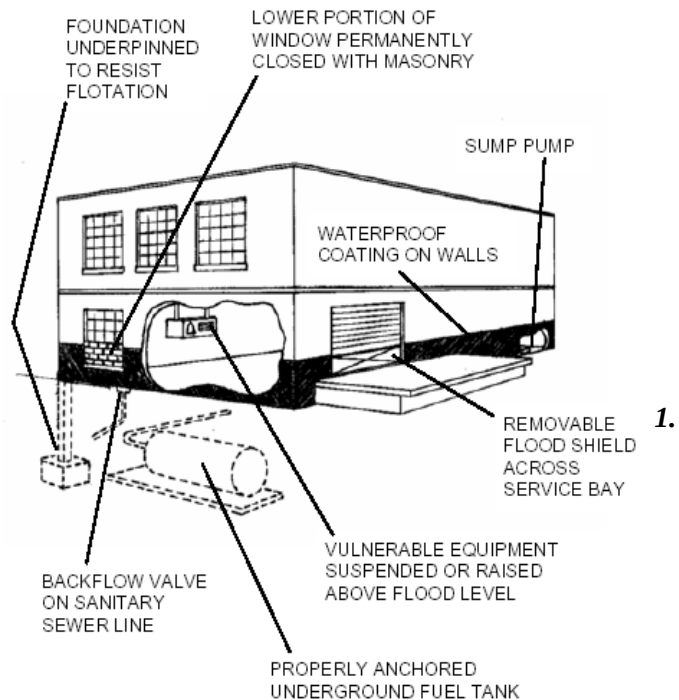
Because of the water pressures that accompany a flood, watertight floodproofing can be a tricky and dangerous endeavor. For example, designers relying on fill to support the walls against hydrostatic pressure must account for the possibility of a lengthy flood saturating the fill. Saturated fill is like no protection at all. Walls of cinder or concrete block or even poured concrete will collapse under more than 3 or 4 feet of flood depth.

Dry floodproofing relies on the strength of the walls to keep water out of the building. There are occasions, however, where it may be appropriate to allow water to enter a building if no damage would occur (a garage, for example, or a storage building for mobile construction equipment). This method is called wet floodproofing and is permitted only by variance. A variance for wet floodproofing a building should ensure that the building meets all the requirements for an elevated foundation discussed above. Remember that insurance rates will be very high for structures that are wet floodproofed. Further guidance can be found in the FEMA Technical Bulletin, TB 7-93, *Wet Floodproofing Requirements*.

DRY FLOODPROOF YOUR BUILDING

One way to protect a building and its contents from flood damage is to seal the building so that flood waters cannot enter. This method, referred to as "dry floodproofing," encompasses a variety of measures (some of which are covered by separate fact sheets – see back of this sheet):

- applying a waterproof coating or membrane to the exterior walls of the building
- installing watertight shields over doors, windows, and other openings
- anchoring the building as necessary so that it can resist flotation
- installing backflow valves in sanitary and storm sewer lines
- raising utility system components, machinery, and other pieces of equipment so that they are above the flood level
- anchoring fuel tanks and other storage tanks to prevent flotation
- installing a sump pump and foundation drain system
- strengthening walls so that they can withstand the pressures of flood waters and the impacts of floodborne debris



CHAPTER 5 – PROTECTING STRUCTURES

E. Substantial Improvements/Substantial Damages

Defining Substantial Improvement

The term *Substantial Improvement* (SI) means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure **before the start of construction of the improvement**. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does **not** include:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications **which have been [previously] identified by the local code enforcement official** and which are the minimum necessary to assure safe living conditions, or
- (2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, and a variance is obtained from the Board of Appeals.

Notes:

- Where a structure is substantially damaged, the assessment of market value of the structure refers to the point in time before any substantial damage occurred.
- Value of work to repair sanitary or safety code violations, that is to be excluded from the 50% calculation, must directly address a citation of violation received from the code official prior to the start of construction of an improvement or prior to the occurrence of substantial damage.
- Substantial improvement most often occurs in non-disaster situations through the rehabilitation of or addition to structures.
- Fair market value is for the structure subject to the improvement only. When determining the market value of the structure, do not include the value of the lot, accessory structures, contents, landscaping or septic system.

When reviewing the value of the improvements, do not include architectural fees, appraisal fees, or permit fees. Essentially the primary factors of the improvement cost are labor and materials. There must be a value included for all materials and labor even if donated. Material costs included must be comparable to what one would expect to pay at any retail facility. Labor costs must be based on prevailing labor rates in the community.

A substantially improved structure must be compliant with the standards of a municipality's local ordinance and/or NFIP regulations. Of primary concern is the requirement that the structure be elevated (or floodproofed if it is a non-residential structure) to or above the level of the 100-year or base flood, and meet other applicable requirements.

The substantial improvement requirements apply to two different types of structures:

1. all existing (pre-FIRM) at the time a community adopted a floodplain management ordinance. Many of these structures do not meet the standards of the ordinance adopted, but are grandfathered (only until such time of a substantial improvement).
2. new construction (post-FIRM) in communities that have undergone map revisions resulting in areas with more restrictive zone designations that include their location.

A structure is **substantially damaged** when damage of any origin is sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.

CHAPTER 5 – PROTECTING STRUCTURES



(Brunswick, ME) This structure is in the process of being elevated. Photo- Maine Floodplain Management Program

The repair of a structure that has been declared substantially damaged is automatically considered a substantial improvement. The structure must be elevated (or floodproofed if it is non-residential) to one foot above the level of the base flood, and meet other applicable ordinance requirements. Where the structure is located in a coastal high hazard area (Zones V1-30 and VE), the elevation must be on pilings or columns so that the bottom of the lowest horizontal structural member of the lowest floor is elevated to one foot above the base flood level. This foundation must be anchored to resist flotation, collapse and lateral movement due to the combined effects of wind and water loading. Before issuance of a permit to reconstruct a substantially damaged structure located in a V Zone, a registered professional engineer or architect must develop, review and certify that the structural design, specifications and plans for the construction meet the requirements of the ordinance and NFIP standards.

Where a building has been destroyed down to the foundation, and is to be reconstructed upon the original foundation, the reconstruction must be considered a substantial improvement. The old foundation may have a "residual" value, but if 50% of the building itself is damaged, it is a substantial improvement.

For more information about substantial damage, determining market value, estimating cost of repair, and post disaster permitting consult FEMA publication 213, *Answers to Questions About Substantially Damaged Buildings*.

CHAPTER VI – ADMINISTRATIVE PROCEDURES

Chapter Summary

Communities participating in the National Flood Insurance Program must have a development permit system in place to ensure that new development meets the standards explained in Chapters IV and V. Permits must not be issued unless the proposed development complies with these standards.

After a permit is issued, the project must be periodically inspected to ensure that it is built according to the approved plans. It is very important that records of the plans and inspections be kept.

Occasionally, conditions may warrant use of a variance procedure to waive one or more of the regulatory standards of the NFIP. Variances, however, can only be granted if they are consistent with the purposes of the floodplain ordinance, state law and the NFIP regulations.

A. *The Development Permit System*

The NFIP requires that a community have a development permit system [44 CFR 60.3(b)(1)]. Many Maine communities already have such a system to administer a land use, building code, zoning, or similar ordinance.

A model permit system is described as part of the Model Ordinance (Articles II, III, IV, and V.F.). It is designed solely for floodplain regulations. The model ordinance can be modified or the floodplain standards incorporated into other ordinances if the permit system will be used for other purposes such as ensuring that new buildings meet minimum fire safety or sanitary standards or zoning regulations.

A model application and permit package and permit decision tree are included in Appendix B of this manual to assist a community in meeting the ordinance and permit requirements of the Program. Electronic copies of the model permitting system may be found on the Maine Floodplain Management's website at <http://www.maine.gov/spo/flood/ord/>.

The Enforcement Official

In the Model Ordinance, the title of the person responsible for administering floodplain regulations is either left blank so the community can fill it in with the proper local title, or customized to fit the community by the staff of the Maine Floodplain Management Program.

For regulatory purposes, the "Code Enforcement Officer" (or "CEO") is the individual responsible for administering this ordinance. Fair, firm administration is essential to the success of any permit system. Proper administration is dependent upon the interest and capability of the CEO and the support received by the governing board.

The appointment procedure for the Code Enforcement Officer should be spelled out in the enabling ordinance. In many small towns, the position is part-time. Technical qualifications are important to the selection process and CEO certification is required. A basic knowledge of construction is a must. The CEO must work well with others. An official accomplishes more by tactfully explaining permit system intricacies than by quoting ordinances and regulations. The CEO should act as an advisor, ready to help permit applicants protect their property against flood damages.

The duties of the CEO are addressed in Article V of the Model Ordinance. Basically the official is responsible for ensuring that: floodplain development projects receive the necessary local and state permits; seeing that the proper records are maintained; and confirming that a project complies with ordinance requirements.



Topsham, ME, Code Enforcement Officer and assistant. Photo by Lou Sidell, Maine Floodplain Management Program

CHAPTER VI – ADMINISTRATIVE PROCEDURES

Permit Application

Federal law requires that no construction or development within the SFHA may begin without a permit issued by the community participating in the NFIP. A person who wants to develop in the floodplain submits an application form (see Appendix B) and the development plans to the Code Enforcement Officer.

Using the decision tree shown in Appendix B, the CEO reviews the application to see if the project will meet ordinance requirements. If so, the permit is issued. If not, the permit is denied and documented with a written explanation. An applicant whose permit has been denied may pursue one or more of the following courses of action:

1. Redesign and resubmit a project so that is compliant.
2. If the applicant feels that the official made a mistake or has misinterpreted the ordinance, an appeal to the board of appeals may be made.
3. If the applicant believes the ordinance imposes a unique hardship on the proposed development, a variance may be requested (see discussion on variances later in this chapter).
4. Relocate the project out of the floodplain.

Process and Inspections

Once a permit is issued, the Code Enforcement Officer is responsible for ensuring that the project is built according to the approved plans. This can be done by one of two methods. The easier method is to tell the applicant to have an engineer inspect the project. The engineer would certify to the community that it was done in accordance with the ordinance. This is a required method for technically complex projects, such as building a floodproofed factory.

However, in most, an expensive method is not warranted. Development projects that include elevated buildings, or buildings elevated on fill, can be inspected by the CEO, but may require an Elevation Certificate, Floodproofing Certificate or professional engineer's certification of relevant standards or other plans or documents completed by someone with a professional seal, including architects. When the development is a new building or a substantial improvement, at least three inspections should be made:

1. After the foundation is staked out, but before construction begins, setback out of the floodway, filling and other site requirements are checked. Work should not start on the foundation until this inspection has been successfully passed.
2. When the foundation is completed, the lowest floor elevation is inspected (see following discussion on record keeping). Work should not proceed with the walls or floor until the structure has passed this inspection. If the floor elevation is not high enough, a stop work order may be issued or the permit may be revoked until the building is corrected. The model ordinance requires that communities adopt a two-part permit system. The first permit (or Part 1 permit) authorizes work only to the point of establishing the lowest floor, be it a elevated floor or a "slab on grade". The second part of the two-part permit system allows the remainder of the building to be constructed after the lowest floor elevation has been certified with a professionally executed Elevation Certificate. While not required by the NFIP regulations, the two-part permit system has become recognized nationwide as a valuable tool that helps the applicant and the community by recognizing a substandard elevation prior to the building being completed.



A FEMA Hazard Mitigation Specialist meets with Fayette, Maine town officials after the flood of March 2007.

CHAPTER VI – ADMINISTRATIVE PROCEDURES

3. When construction is completed, the owner is not allowed to occupy the building unless this inspection shows that the building meets all the requirements of the ordinance and a completed “as built” Elevation Certificate has been submitted by the owner. (See Article VIII of the Model Ordinance).

Other minor development projects may be completed with fewer inspections.

Use or Occupancy Permit

Some communities require that a new building cannot be used or occupied without a use permit or a “certificate of use and occupancy.” The CEO would not issue a use permit until the building could pass the final inspection.

The model ordinance, in Article VIII, provides for a “Certificate of Compliance”. No structure may be occupied without the issuance of a *Certificate of Compliance*. Submission of an Elevation Certificate is required prior to the issuance of the *Certificate of Compliance*. A community may call the final approval something else such as a Certificate of Completion or Certificate of Occupancy. The intent is to allow the community leverage to ensure the building is safe and suitable for habitation and that the requirements of the permit were met.

Fees

It is reasonable for communities to require that the owners of projects in the flood hazard area bear the cost of administering the permit review for their project. However, a building permit system should not be viewed as a lucrative source of revenue for the community. Maine law limits permit application fees to be reasonably related to the costs of administration. Fees should be set to pay for the salary of the enforcement officer and expenses of administration.

In recognition of the varying degree of difficulty and amount of time required to review and process flood hazard development permit applications, some communities are inserting language for a split or sliding fee schedule.

Some communities already have fee structures in other ordinances that are set according to the value of the proposed project. In an effort to promote consistency between ordinances, they might choose to adopt a similar fee structure for the floodplain ordinance. Other communities want the flexibility of allowing their Board of Selectmen to reassess and establish fees annually, without specifying the exact amount within the ordinance. Many communities simply assess a larger fee for new construction or substantial improvement projects (which often require more time and effort to review) and a smaller fee for all other (minor) projects. The fee should form a reasonable standpoint to reflect the cost of reviewing the project.

Some options may include:

1. assessing a fee that is a percentage of the proposed project’s value, (i.e. \$1/\$1000);
2. setting fees according to monetary thresholds based on the value of the proposed project, for example:

\$10 - project value < \$1,000	\$40 - project value > \$25,000 but < \$50,000
\$20 - project value > \$1,000 but < \$10,000	\$50 - project value > \$50,000
\$30 - project value > \$10,000 but < \$25,000	
3. charging a fee of \$25 for minor development (as defined) and a \$50 fee for new construction and substantial improvements;
4. allowing the Board of Selectman to annually establish a fee; or
5. assessing fees based on the amount of time required to process the application. Some communities have adopted language similar to the following for the third and fourth points shown above:

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“A nonrefundable application fee of \$25 for minor development or \$50 for new construction or substantial improvements shall be paid to the City/Town Clerk or the CEO and a copy of a receipt for the same shall accompany the application.”

“A nonrefundable application fee, as established annually by the Board of Selectmen shall be paid to the City/Town Clerk and a copy of a receipt for the same shall accompany the application.”

The Model Ordinance (Article IV) suggests that additional fees be collected if the CEO or Board of Appeals needs the assistance of an engineer or other expert.

B. Record Keeping Requirements

The CEO is responsible for keeping all appropriate records related to the floodplain ordinance. A complete record must be kept for every permit application. This is particularly important when a permit is denied or when a request is referred to the board of appeals. Normally a file folder is kept for each project. The file should contain the permit application, copies of all letters pertaining to the project, variance documents, completed checklists used during inspections, and the lowest floor elevation or floodproofing certificate.

The CEO should have sufficiently up-to-date copies of the ordinance, federal regulations, manuals, and flood maps. These may be loaned to one-time applicants; they may be given or sold to those who submit frequent permit applications, such as contractors. The amount charged would be just enough to cover the cost of reproduction. All records must be made available for public inspection.

Biennial Report

All communities participating in the NFIP have agreed to submit a report to FEMA. Every two years, FEMA sends out a report form that must be completed and returned within 30 days. It requests information about changes to the community's flood hazard areas and corporate boundaries. If there have been changes, copies of the new data or maps must be submitted with the report, so your flood insurance map can be revised. It also asks about permits and variances granted in the floodplain. Code Enforcement Officers with accurate and up-to-date permit files will find the report form easy to complete. A sample Biennial Report is shown in Appendix K.



(Gardiner, ME)
Flood gauge picture taken in 2002 (above) and in April 2004 (below).



Elevation Certificate

The Model Ordinance requires that the lowest floor (including basement) of all new structures be one foot above the BFE. Article V, Section G of the Model Ordinance requires the building official to keep a record of these elevations. This is an important record keeping requirement of a community's participation in the NFIP. The elevation record is used both to set the flood insurance premium on the building and by the community official to check that new buildings are properly constructed.

IT IS CRITICAL THAT THE ELEVATION OF THE LOWEST FLOOR BE PROPERLY TAKEN AND RECORDED FOR EACH NEW BUILDING IN THE FLOODPLAIN.

The NFIP has developed an Elevation Certificate that must be used to record the lowest floor elevations for any new or substantially improved building. The form (included in Appendix D and available for reproduction) includes a section to record the elevation of the adjacent grade, lowest adjacent grade and lowest floor elevations.

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All such forms and data should be kept in the permit file. Property owners who request a "Letter of Map Amendment" (see Chapter II, Section H.) must at a minimum submit the **lowest** adjacent grade data with their request, however most requests require the Elevation Certificate to be filled in completely.

In recording elevations, it is necessary to use the same datum used in the flood insurance study, usually National Geodetic Vertical Datum (NGVD) or the Mean Sea Level 1929. Lowest floor elevations are measured at the top of the floor or slab, except in coastal high hazard areas. In coastal high hazard areas, the bottom of the lowest structural member must be one foot above the BFE. Where a FIRM shows a Zone AO with a number, the "datum" is the highest adjacent grade to the structure, rather than the base flood elevation. Buildings in Zone AO must have their lowest floor elevated above the **highest adjacent grade** to the depth number (in feet) specified on the FIRM.

The elevation record can be completed by the building official, an engineer or a surveyor. The Model Ordinance requires that the elevation certificate be completed by a Professional Land Surveyor, architect, or engineer. Only a registered professional engineer or architect can complete the floodproofing certification.

C. *Checking Elevations in the Field*

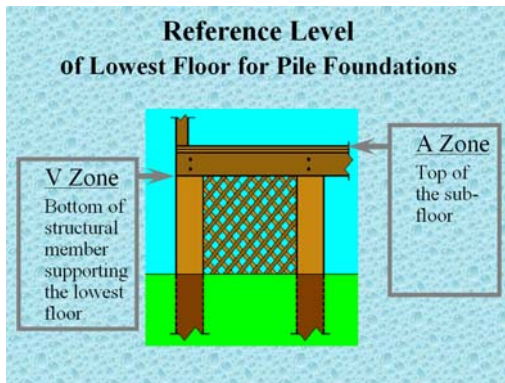


(Kennebunk, ME) Field staff measures flood levels after 2007 nor-easter.

The purposes of flood insurance rating and floodplain regulations do not require the degree of accuracy usually demanded in surveying. The records need only be accurate to within $\frac{1}{2}$ foot. This level of accuracy can easily be attained by a code enforcement officer using a level.

It may be useful to field check elevations to ensure that construction is proceeding within permitting guidelines. However, if the community's local ordinance is based on the Model Ordinance provided by the Floodplain Management Program, there should be no need for the CEO to field check elevations. Article V, Section F of the model requires that a Professional Land Surveyor certify that the lowest floor meets the required elevation prior to the issuance of a permit for the construction of the remainder of the building.

Whereas the two-part permit system is not required by the FEMA regulations, and some communities may not have included it in their local ordinance, a complete discussion on how to check elevations in the field has been included in Appendix C.



Variances

A variance is a relaxation of one or more specific flood damage prevention standards of the Model Ordinance, Article VI. It may be granted only for a specific project on a specific site. Strict requirements of the ordinance may be relaxed, but a variance must remain consistent with the purpose of the ordinance. Whereas a floodplain management ordinance is a zoning ordinance, dividing the town into districts, a variance is granted in accordance with the

requirements of Title 30-A MRSA §4353.

Variances may not be used to waive the standards for every permit application. This would be the equivalent of amending the ordinance, an action that would likely not meet minimum NFIP standards.

Communities with existing zoning ordinances or building codes should follow the variance procedures of those ordinances. They should also consider adding some of the procedures and requirements of variance from the model into their existing code. Communities without an existing procedure should use the method presented in Article X (Article IX in the b, c, and d non-coastal models) of the model.

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Variance Standards

Under the Zoning Adjustment statute, applicants for variances must prove they are necessary because the ordinance causes "undue hardship". The statute spells out four criteria the applicant must show have been met in order to prove undue hardship. These four criteria are:

1. The land in question cannot yield a reasonable return unless a variance is granted;
2. The need for a variance is due to unique circumstances of the property and not to the general conditions in the neighborhood.
3. The granting of a variance will not alter the essential character of the locality; and
4. The hardship is not the result of action taken by the applicant or a prior owner.

To be considered for a variance the applicant must present evidence to show that the four criteria in Title 30-A MRSA §4353 have been met. In addition, Article X, Section B (Article IX in the b, c, and d non-coastal models) of the model ordinance contains three additional requirements. This section is designed to ensure that the applicant has no feasible alternatives and that there will not be an additional burden placed on the public. One thing to note, a standard should be adjusted only enough to grant the relief needed.

Hardship is a difficult standard for an applicant to demonstrate. Increased costs associated with elevating the building are not considered to be a hardship. The Maine Supreme Judicial Court clearly ruled that a "reasonable return" does not require "maximum return" on construction (*Barnard v. Town of Yarmouth*, 313 A.2d 741 [1974], *Grand Beach Assoc., Inc. v. Town of Old Orchard Beach*, 516 A.2d 551 [1986]). The applicant must prove to the satisfaction of the Board of Appeals that a substantial hardship will be suffered, and that the property has no reasonable economic use under the terms of the ordinance. It is also important to warn the applicant that if flooded, they will endure a different kind of hardship.

The following document contains valuable information for local officials who are faced with a situation in which a variance may be required. While this document was produced by FEMA Region V (Chicago) in April 1998, the guidelines apply to current NFIP participants.

FEMA Variance Guidelines April 1998

INTRODUCTION

The Federal Emergency Management Agency (FEMA) does not set forth absolute criteria for granting variances from the floodplain management provisions of Title 44 CFR, §60.3, §60.4, and §60.5. However, general variance criteria have been established in the NFIP regulations under §60.6 (a). These criteria provide the basis for each community participating in the NFIP to determine if a structure qualifies for a variance from the local floodplain management regulations. The variance criteria are a compilation of standards most frequently found in State variance law, coupled with specific floodplain management standards.

In all cases, the responsibility to approve or disapprove a variance rests on the community, not FEMA. However, FEMA evaluates variances granted by a community to determine if they are consistent with the objective of sound floodplain management. The variance criteria are intended to inform participating communities of the guidelines that FEMA will use in such an evaluation.

To ensure consistency with sound floodplain management, communities should issue variances only on a finding of good and sufficient cause, exceptional hardship, and a determination that variance will not result in additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances. In addition, a variance should be the minimum necessary, considering the flood hazard, to afford relief.

If the criteria at §60.6 (a) are closely adhered to, variances that completely waive the substantive NFIP requirements which provide protection to the 100-year standard should be quite rare. In most cases, some lower level of protection or alternative methods to provide comparable protection.

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DESCRIPTION AND INTENT OF THE REGULATIONS COVERING VARIANCES

The NFIP variance criteria assume the principal of zoning laws: that variances pertain to a piece of property and are not personal in nature. Though standards vary among States, in general a property issued variance is granted for a parcel of property with physical characteristics so unusual that complying with the ordinance would create an exceptional hardship to the applicant or the surrounding property owners. Those characteristics must be unique to that property and not be shared by adjacent parcels. The unique characteristics must pertain to the land itself, not to the structure, its inhabitants or the property owners. Therefore, financial hardship or the health condition of the property owner alone is never sufficient causes for granting a variance.

It is common practice for some administrative bodies to grant variances for zoning, property setback, and non-health and safety regulations based on personal criteria and the character of the owner rather than the nature of the property. However, granting a variance from NFIP floodplain management standards on these grounds would rarely be an appropriate action. Such action would not be consistent with the community's need to ensure public safety.



(Damariscotta, ME) Schooner Landing – when this property was sold the insurance and insurance rate was transferred to new owner (grandfathered). The structure would be uninsurable under current NFIP standards. Photo by Bonnie Cowle, Maine Floodplain Management Program.

Once the character of the owner changes (i.e., the property is sold, leased, etc.) the justification for a variance based on personal considerations no longer exists. Because the structure remains, future owner/occupants are exposed to the nonconforming nature of the property and whatever hazards and public safety problems are associated with it. This exposure to flood risk is unnecessary because the sole reason for granting the variance was the personal condition of the previous owner.

The variance criteria in §60.6(a) must be read as a whole and not piecemeal. Variances can be granted for new construction and substantial improvements only if all criteria in §60.6(a) and the local ordinance are met. If any one of the criteria is not met, the variance should not be granted.

Floodways - §60.6 (a) (1)

The floodway is defined (§59.1) as:

“the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.”

It is important to reserve the floodway as a water conveyance area because any encroachments or obstructions placed in the floodway will increase flood heights and consequently flood damages. Thus, at §60.6 (a) (1):

“Variances shall not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.”

The intent of this variance criterion is to prohibit non-conforming development that may increase flood levels; these, in turn, could potentially increase the flood damage experienced by owners of nearby properties.

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In most cases, there will be alternative locations for the proposed development outside the floodway, or other actions can be taken to compensate for increased flood stages or the floodway can be modified through flood control measures. If there is no feasible or practical alternative site to locate the development, then it must meet all criteria under §60.6 (a) and, in accord with §60.6 (d) (3), demonstrate that no increase in flood stages will result. Section 60.3 (d) (3) states that:



West Front Street parking lot in Farmington, ME. MEMA Photo.

“The community shall prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway that would result in any increase in flood levels within the community during the occurrence of the base flood discharge.”

The only exceptions to this provision, located in §§60.3 (c) (13) and (d) (4) of the NFIP regulations, allow for the increases in flood levels under certain conditions and upon approval by the administrator.

In cases where all variance criteria in §60.6 (a) are met and a “no-rise” analysis and certification has been approved, the community may find it appropriate to issue a variance. However, because of the potential hazards involved, many states and communities exceed minimum NFIP requirements by prohibiting the issuance of variances for floodway development altogether, regardless of whether all variance criteria are met and a “no-rise” certification was made. Therefore, a community may wish to prohibit all variance requests based on three potential flood hazards in the floodway:

1. the hazard to the development itself;
2. increased hazard which the development may cause to other properties; and
3. risk to individuals stranded in isolated structures surrounded by what is in many cases rapidly flowing, debris-laden floodwaters, and the risk to the rescue workers.

For example, the granting of a variance, which allows the placement of a manufactured home below the BFE in a floodway, will place the lives of its inhabitants at risk because during a flood it is likely that the manufactured home will be destroyed. Aside from this danger, experience has shown that a manufactured home can float into other manufactured or conventional homes and result in severe structural damage; or, become wedged in a bridge opening or culvert, which could in turn dramatically increase flood heights upstream and endanger other citizens. Local emergency personnel may be endangered attempting to rescue the occupants before the manufactured home is carried downstream.

Because of the hazards of granting variances for development in the regulatory floodway, community officials should carefully consider all of the possible dangers created by the variance issuance. In most cases, a review will indicate that the benefits of allowing the development are outweighed by the costs of increased future flood damage and increased hazards to life.

Lots of One-Half Acre or Less - §§60.6 (a) and (a) (2)

“While the granting of variances generally is limited to a lot size less than one-half acre (as set forth in paragraph (a) (2) of this section), deviations from that limitation may occur. However, as the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases.”

“Variances may be issued by a community for new construction and substantial improvement to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the procedures of paragraphs (a) (3), (4), (5) and (6) of this section.”

A common, but unjustifiable argument for variance requests on lots of less than ½ acre is one based on personal convenience or aesthetics; i.e., the height inconsistency that would result between adjacent

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structures if the middle one was elevated to or above the BFE. Aesthetics or other personal considerations should never be a consideration when making variance determinations on ½-acre lots. Section 60.6 (a) (2) only addresses the physical, not the aesthetic characteristics of a lot in relation to the adjacent lots. In balancing considerations for personal issues versus issues related to public health and safety such as minimum NFIP criteria, a community should always choose public safety and the protection of lives and property.

The intent of the above variance criteria has been misinterpreted to mean that variances can be systematically granted for all intermediate or “in-fill” subdivision lots of less than ½ acre. Such variances are not to be assumed. The intent of §60.6 (a) (2) is not to place a lesser (or no) burden on ½-acre lots, but to place a greater burden on lots larger than ½ acre. Section §60.6 (a) specifically states, “as the lot size increases beyond ½ acre, the technical justification required for issuing a variance increases.”

The ½-acre lot size threshold is meant to be a general cutoff point. As §60.6 (a) states, “deviations from that limitation may occur.” However, experience shows that for intermediate lots greater than ½ acre, a structure can, in nearly all instances, be elevated on fill to or above the BFE without causing measurable drainage impacts to the adjacent structures whose lowest floor elevations are at or below grade.

Because of the additional storage and infiltration capacity provided by larger lots, and because of the flexibility in being able to choose a location on such a lot that would lessen environmental impact, the technical justification required for issuing a variance based on potential drainage problems increases with the lot size beyond ½ acre. Conditions will vary based on the size of the structure relative to the lot size, and the location of the structures relative to each other.

Many design and construction alternatives exist that will ease a hardship caused by potential drainage problems, while still allowing a structure in this situation to be built in full compliance with NFIP regulations. Several acceptable elevation techniques cause no more (and sometimes less) disruption of drainage patterns that provide an alternative to building a structure at ground level with a variance. Examples include: 1.) elevating a structure on pilings, columns, or extended foundation walls; 2) grading or landscaping the elevated fill pad to drain away from the adjoining properties; and 3) creation of natural or artificial infiltration fields or systems located at the intersection of the fill slope and the natural ground. Such alternatives can be cost effective, visually appealing, and provide drainage solutions problems that do not harm adjacent structures.

In summary, the granting of variances for small lots where elevation on fill will pose an exceptional hardship due to drainage problems should be rare. Variances for “in-fill” lots of ½ acre or less should be granted on the basis of potential drainage problems only 1) if, as §60.6 (a) (2) explicitly states, all other criteria [§§60.6 (a) (3), (4), (5), and (6)] are met, and 2) if a professional engineer or architect has prepared and certified data demonstrating that there are no technically feasible methods available to alleviate or mitigate the drainage problems.

Good and Sufficient Cause - §60.6 (a)(3)(i)

“Variances shall only be issued by a community upon a showing of good and sufficient cause.”

A variance request by an applicant that is based on good and sufficient cause is one that deals solely with the physical characteristics of the property, subdivision lot, or land parcel under question. A rendering of a good and sufficient cause should never be based on the character of the planned construction or substantial improvement, the personal characteristics of the owner or inhabitants, or local provisions that regulate non-health and public safety standards (e.g., aesthetic restrictions of subdivision homeowner associations).

“Good and sufficient” cause means that by granting a variance there is substantial and legitimate benefit to be achieved by numerous other citizens, or the community as a whole. It is not based on the convenience or financial relief that the variance would afford the applicant. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of one’s neighbors, or homeowners’ association restrictions, likewise do not, as a rule, qualify as “good and sufficient” causes.

“Good and sufficient” cause for a variance occurs when a property has such unusual physical characteristics that complying with NFIP regulation in a local ordinance would create an exceptional hardship to the applicant, the

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surrounding property owners, or the community in general. In addition, the unusual physical characteristics must be unique to that property and not be shared by adjacent parcels or be typical of other lots in the community.

Physical conditions are inherent to the land or property and usually will not change or be significantly altered over time. Therefore, the justification for granting a variance based on physical characteristics will usually not be undermined over time. In contrast, personal characteristics and intended uses of buildings can change dramatically with changes in ownership. Likewise, local aesthetic and other non-health and safety restrictions are frequently altered over short periods. Thus, the justification for granting variances based on characteristics other than the physical conditions of the property can easily become compromised.

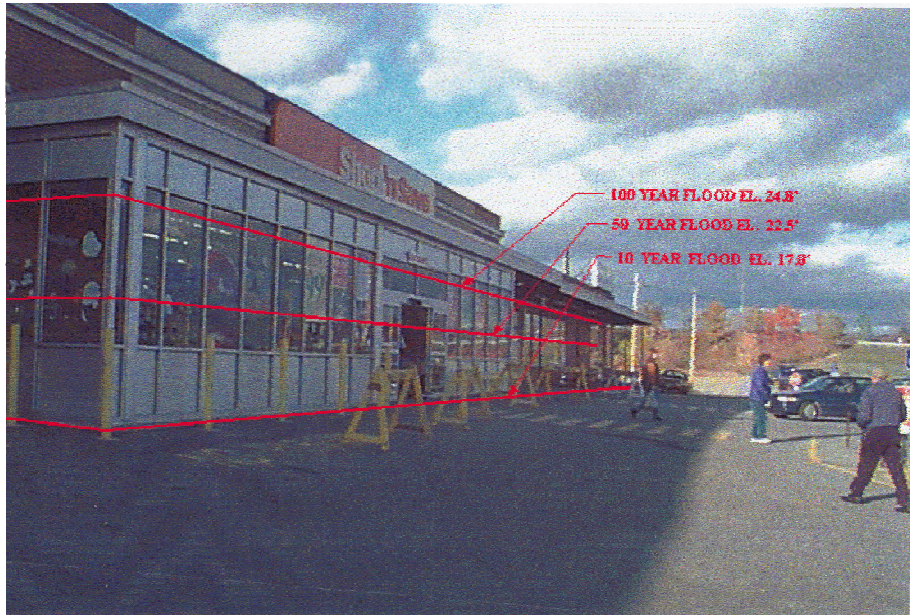
Once the character of the owner changes (i.e., the property is sold, leased, etc. or the owner no longer suffers from financial hardship) the justification for the variance no longer exists, but the structure remains. Future owner/occupants are exposed to the nonconforming nature of the property and whatever hazards and public safety problems are associated with it. This exposure to property and personal risk from flood damage is unnecessary except for the personal condition of the previous owner.

A common misinterpretation of what constitutes “good and sufficient cause” for granting a variance is based on the financial status or other monetary circumstances of the owner. Financial hardship of the property owner is never a good and sufficient cause for granting a variance. Granting a variance for construction in a flood hazard area based on financial hardship only increases the probability that owners least able to afford it will suffer even greater monetary adversity (not to mention health and safety risks) when the structure is damaged during a flood.

[The next section is a break in *the FEMA Variance Guidelines* for an overview of a high profile variance that was granted here in Maine]

Anchor Store Receives Floodplain Management Ordinance Variance:

Cottle's was a mom and pop grocery store that sat on a parcel of land in Gardiner, Maine near the confluence of the Cobbosseecontee Stream and the Kennebec River. The parcel had, at one time, been a back-water pond where logs were floated in for a mill to pull and cut up. The pond was filled with logs and debris that would “environmentally” not be considered appropriate by standards today. Sometime in the 1960s, Cottles became a part of the Shop 'n Save grocery chain and sometime later, Hannaford's.



One of Maine's worst floods arrived on April 1, 1987. The April Fools Day Flood, was a 100-year event and the Shop & Save flooded to the 100 year flood elevation of 24.8', as shown in the picture above.

Flood Levels at Gardiner Shop 'n Save, from the 1994 FEMA flood insurance study. 10 year flood level is at the existing ground floor of Shop 'n Save, 50 and 100 year flood levels cause 5.5 feet and 8.8 feet, respectively, of water above the floor. The 1987 flood was a 100 year flood.

There are conflicting accounts about the height of the flooding in the store. It was either 8 feet or 12 feet

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above the floor at this oft flooded location. Flood waters enter the store's basement long before the flood waters reach the outside adjacent grade. During previous flooding events the store had parked trucks on the manhole covers in the parking lot thinking that they could prevent the flood water from reaching the store too soon. Various accounts tell of the trucks being lifted by the force of the water as though they were on hydraulic jacks.



Hannaford Brothers asked the city code officer for a permit to do a \$2.9 million dollar improvement. The permit was denied because the CEO determined that the development was a substantial Improvement and required the structure either to be elevated or floodproofed. The proposal did not encompass those standards as required by the community's Floodplain Management Ordinance.

On a Tuesday evening in November 1999, a Floodplain Management Workshop was conducted for the Gardiner Board of Appeals to assist them in

understanding the floodplain management mission.

(Gardiner, ME) The overflow from the Kennebec River and Cobbosseeconnet Stream floods the parking area of a local supermarket in April 2005.

On the following Thursday evening, a public hearing was held on the store's request. Several of the city councilors as well as the local chamber of commerce and local residents testified in favor of the store. The store argued that it is impossible to elevate and impossible to floodproof to depths of 8 to 12 feet and that their only

course of action would be to leave the city if not granted relief. The Board of Appeals voted 6-0 to grant the variance. The community stated that it needed a large "anchor" store for the downtown and they were pleased that the store was reinvesting in the community and not promoting sprawl by moving to a location outside of town. There was no local opposition.

The community was made aware that they might face suspension from the National Floodplain Insurance Program. As discussions unfolded following the community's granting of the variance, FEMA noted that the criteria for suspension say there must be a pattern of variances or clear failure to properly administer the regulations. Over the following many months there were several meetings with city leaders, FEMA and the Maine Floodplain Management staff as well as attorneys. The attorneys agreed that one variance did not constitute a pattern.

The grocery store representatives agreed to abandon the use of the basement (in fact they had already accomplished that), use flood resistant material, as prescribed in FEMA Technical Bulletin FIA 2-93, (<http://www.fema.gov/plan/prevent/floodplain/techbul.shtm>) elevate all mechanicals to the roof and they also adopted and filed an emergency action plan. One component of the plan is for the store to have a number of trucks at the ready in order to move the goods to a safer place. The plan establishes a threshold for initiating the implementation and identifies who is responsible for making that determination. There have been several occasions when the parking lot is full of large trucks as the waters rise.

To date, the store has not flooded since the variance was granted. The store's flood insurance policy is being re-rated as a post FIRM structure and consequently they will see much higher flood insurance premiums. While a variance may "relax" some of the development standards, it does result in higher rates because of the increased exposure to flooding.

This variance issue has become a bench mark in the Maine floodplain management arena. Due to the high profile media coverage nearly all of the current code officers have raised questions regarding "How come they got to do that?" While it has been touted by many in the field as a bad example, it has become a valuable example of how the system works, what are the ramifications, and what should and can be done to mitigate. It

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has also helped us better define variance criteria. At this point in time we are now laboring under the assumption, based on discussions with FEMA that while one variance does not constitute a pattern, perhaps two variances may constitute a pattern. This is not to say variances can never be granted. The NFIP recognizes historic structures and water dependent uses as potentially legitimate reasons for a variance. Any variance considered by a community must meet the standards outlined in the Maine statutes, the minimum NFIP standards, and the community's FMO criteria for review. A variance is the means of the last resort and must always be the minimum necessary. Every time a community grants a variance a red flag goes up somewhere in the Program.

[Continuation of the FEMA Variance Guidelines]

Exceptional Hardship - §60.0 (a) (3) (ii)

“Variances shall only be issued by a community upon a determination that failure to grant the variance would result on exceptional hardship to the applicant.”

In determining whether an applicant has established an exceptional hardship sufficient to justify a variance, the variance or appeal board or other local governing body must weigh the applicant's hardship against community goals and the purpose of their floodplain management ordinance. When deciding whether to approve a variance to flood elevation or floodproofing requirements, the question to ask is this: Does the hardship that this individual applicant would face outweigh the community's need for strictly enforced regulations that protect its citizens from the dangers and damages of flooding? Only an exceptional, unique hardship relative to the physical character of a piece of property should persuade local officials to set aside provisions of an ordinance designed with the whole community's safety in mind.



(Shapleigh, ME) Houses located near rivers and lakes in York County were surrounded by high water for many days after heavy rains inundated the region in May, 2006. Photo by Jocelyn Augustin.

The hardship might not have to be so severe if the applicant were seeking a variance to a setback ordinance, for instance, which was intended merely to simplify street repair and modifications. In the course

of considering variances to flood protection ordinances, however, variance boards continually must face the more difficult task of frequently having to deny requests from applicants whose personal circumstances evoke compassion, but whose hardships are simply not sufficient to justify deviation from community-wide flood damage prevention requirements.

The hardship that would result from failure to grant a requested variance must be exceptional, unusual, and peculiar to the property involved. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of one's neighbors, or homeowners association restrictions likewise cannot, as a rule, qualify as exceptional hardships. All of these problems can be resolved through other means, without granting a variance. This is so even if the alternative means are more expensive or complicated than building with a variance, or if they require the property owner to put the parcel to a different use than originally intended, or to build his or her home elsewhere.

For example, a situation in which it would cost a property owner several thousand dollars more to elevate a house to comply with the ordinance and an additional several thousand to build a wheelchair ramp or an elevator to provide access to that house for a handicapped member of the family might at first glance seem like the sort of problem that could be relieved by a variance. However, while financial considerations are always important to property owners and the needs of the handicapped person certainly must be accommodated, these difficulties do not put this situation in the category of “exceptional hardships” as they relate to variances. This is because the characteristics that result in the hardship are personal (the physical condition and financial situation of the people who propose to live on the property) rather than pertaining to the property itself. In addition, the problem of the day-to-day access to the building can be alleviated in any one of a number of ways (going to the additional expenses of building a ramp or elevator), without granting a variance. In fact, one method that facilitates the use of a structure for handicapped persons (especially those in wheel chairs) is to elevate the structure by means of earthen fill.

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Third, the situation of handicapped persons occupying flood-prone housing raises a critical public safety concern. If a variance is granted and the building is constructed at grade, it will be critical that the handicapped or infirm person evacuate when floodwaters begin to rise, yet he or she may be helpless to do so alone. Not only does this pose an unnecessary danger to handicapped persons but also it places an extra demand on the community's emergency service personnel who may be called upon. If the building is properly elevated, the handicapped person can still be evacuated if there is sufficient warning and assistance available. If there is not, that person can, in all likelihood survive the flood simply by remaining at home safely above the level of the floodwaters.

More simply, the property owner's difficulties would not really be relieved by the variance, but likely only postponed and perhaps ultimately increased. It would be more prudent over the long run for the property owner and the community, if the variance were denied and the home built at the proper elevation with handicapped access. This will ensure the safety of all family members when floodwaters rise and protect individual and community investment in the property, as discussed in the paragraphs on public safety and nuisances.

Another common argument for variances from the elevation requirement is the unaesthetic height differential with adjacent structures that would result. To promote architectural and aesthetic consistency, homeowners associations or subdivision boards frequently place restrictions on landscaping and construction practices, such as the total height to which structures can be built. The owner, and usually the prospective neighbors and local homeowners association, protest that the structure, if elevated, will be architecturally uncoordinated with the rest of the structures on the block and that property values will be decreased as a result.

Variance requests that claim exceptional hardships due to architectural considerations or conflicts with local subdivision regulations governing aesthetics should never be granted to waive regulations designed to protect the health and safety of residences. For the following reasons a community would be remiss in its responsibilities to its citizens if it placed appearance before public protection:

1. The hardship would be based on personal preference, not the property per se;
2. Most structures can be elevated such that they are aesthetically pleasing and architecturally consistent, despite the height difference;
3. Elevated structures are much less prone to flood damage, and, therefore, actually increase in value relative to adjacent unprotected structures, especially after they are damaged in a flood;
4. The health and safety risks placed on occupants of the unprotected structure are unnecessary and avoidable.

Increased Flood Heights - §60.6 (a) (3) (iii)

"Variances shall only be issued by a community upon a determination that the granting of a variance will not result in increased flood heights."

A development for which a variance is to be granted must not in any way cause an increase in water surface elevations during floods of any magnitude, not just the base flood. Therefore, for a community to grant a variance, all other variance criteria in Section 60.6 (a) must be met, and the applicant must demonstrate through technical justification that the proposed development will not increase flood heights.

The underlying principal is that an increase in flood heights has the potential to cause flood damage to structures in the community that otherwise would not be flood-prone. In addition, it has the potential to increase the depth of flooding, and thus the damage potential, of structures that are already flood-prone.

To allow increases in flood heights to occur unnecessarily is inconsistent with the objectives of sound floodplain management, and undermines the community's previous efforts to protect structures by requiring elevation or floodproofing to or above the BFE. Increases in flood heights subtract from the level of protection provided by these requirements.

Public Safety and Nuisances - §60.6 (a) (3) (iii)

"A variance will not cause additional threats to public safety or create nuisances."

Variances must not result in additional threats to public safety or create nuisances. Local flood damage prevention ordinances (including elevation and floodproofing requirements) are intended to help protect the health, safety, well being, and property of the local citizens. This is a long-range community effort usually made up of a combination of approaches such as adequate drainage systems, warning and evacuation plans, keeping new property (especially homes) above the flood levels, and participating in an insurance program. These long-term goals can be met if exceptions to the laws are kept to a bare minimum.

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Variances to allow the construction of habitable structures below the BFE, especially in the higher hazard areas such as floodways, places residents of those structures at much greater personal risk. The potential for loss of life is much greater in structures whose first floor is below the BFE, and where flood depths are greater than three feet or velocity is present. A community that waives elevation requirements in these situations is doing a disservice to its citizens. In addition, a community may be held liable for personal injuries or loss of life that occurs to occupants of structures for which a non-compliant variance has been granted.



(Kennebunk, ME) Critical facilities located in the floodplain are at risk. Photo by Lance Carpenter, FEMA.

It is often argued that variances to waive the elevation requirement should be granted for structures where handicapped or elderly persons will be occupants. The basis for this argument is that elevation of the structure will make wheelchair access difficult (i.e., long and expensive ramps) or that elderly people are not physically capable of climbing stairs.

For the same reasons, handicapped and elderly people are less able to quickly evacuate flood-prone structures. They are more likely to become trapped inside structures if they are not told about an imminent and worsening flood hazard, or when floodwaters rapidly rise. As such, it is difficult to imagine a case where a variance would be appropriate for structures when there is to be handicapped and/or elderly occupancy.

Not only does a community's public safety commitment apply to residents of structures located in flood hazard areas, but also to local emergency services personnel. Variances from the elevation requirement increase the risk exposure for personnel required to rescue residents of structures flooded because of the variance. Simply, if structures are elevated to or above the BFE, residents can in all likelihood, survive the flood by remaining at home safely above the level of the waters. The necessity to rescue residents of elevated structures is not as great and local emergency services personnel can concentrate their efforts to areas of greater need.

Public Expense – §60.6 (a)(3)(iii)

“Variances shall only be issued by a community upon a determination that the granting of a variance will not result in extraordinary public expense.”

The public expense is usually monetary (government funds), but can also be non-monetary. An example of extraordinary public expense is the repair or replacement of public facilities and infrastructure damaged by a flood because of a variance issuance. Another example is the construction of flood control projects or other public works to protect structures prone to flooding because of the issuance of variances. There are also public costs associated with emergency floodproofing measures such as sandbags and temporary floodwalls built (with public funds) to protect structures flooded because they were issued a variance from elevation requirement.

The time and equipment expended by emergency services personnel during the rescue of residents of flooded structures is significant public expense. This time and expense is unnecessary, and therefore “extraordinary,” if it is spent rescuing residents of structures for which variances were granted. There is also a significant “missed opportunity” (non-monetary) public expense if an otherwise avoidable injury or death occurs while rescue personnel are busy evacuating structures for which variances were issued.

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(Wilton, ME) (Left) Floods in 1999 caused gabion wall outside of the Wilton Free Library to collapse. (Right) This concrete wall was erected to protect the Wilton Free Public Library in 1999 and has held up through many floods. Photos courtesy of the Town of Wilton.

National expenditures in the form of various Federal disaster assistance programs (e.g., FEMA, SBA, etc.), non-government assistance (e.g., Red Cross), and other charity donations are public expenses. Residents of structures flooded because of the issuance of variances may be entitled to one or more of these many forms of assistance; an increased public expense that, without a variance issuance, could be avoided. Specifically, residents of flooded structures (for which variances have been granted) may qualify for personal grants and monies to provide temporary housing under the terms of FEMA's Disaster Assistance Program.

Another form of public expense occurs when owners of heavily damaged structures (for which variances were granted) cannot afford repairs, and abandon them. When local government is held responsible for repair or demolition (which is usually the case) the additional expense incurred by the public should be considered “extraordinary” because it would not have occurred had a variance not been issued.

Fraud and Victimization - §60.6(a)(3)(iii)

“Variances shall only be issued by a community upon a determination that the granting of a variance will not cause victimization of the public.”

When considering a variance request, local variance boards should consider the fact that every newly constructed building adds to the responsibility of local government and remains a part of the community for fifty or more years. Buildings that are permitted to be constructed below the base flood elevation are subject during all those years to increased risk of damage from floods, while future owners of the property and the community as a whole are subject to all the costs, inconvenience, danger, and suffering that those increased flood damages bring.

One of the biggest potential problems involving variances is the change of ownership of a structure for which a variance has been granted. Future owners that purchase the property may be unaware that it is subject to potential flood damages and can be insured only at very high flood insurance rates. Frequently, resale happens after the structure has been flooded. The original owner repairs the structure and removes all evidence of previous flooding. The structure is then put up for sale in an attempt to “unload” it on prospective buyers that are new to the area or who are otherwise unfamiliar with extent and nature of the local flood hazard.

An example of public victimization is the case of a variance request to waive elevation requirements for mini-warehouse. The units or “bays” of the warehouse are rented to the public for various personal uses such as the storage of excess furniture. Granting a variance in this case would create the potential for victimization of citizens who, unknowing of the flood hazard and the risk to their property, rent units to store their possessions. When the warehouse is flooded and its contents (which are not covered by flood damage by a homeowner's policy) are damaged, the owners may have no recourse for financial compensation. In addition, many stored possessions that are damaged may be family heirlooms, have sentimental or historic value, or otherwise be irreplaceable. Variances that have the potential to cause this type of victimization or fraud on the public should never be granted.

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Existing Local Laws or Ordinances – §60.6(a)(3)(iii)

“Variances shall only be issued by a community upon a determination that the granting of a variance will not result in conflict with existing local laws or ordinances.”

A community is authorized to grant variances from their local floodplain ordinances if the variance is not in conflict with other existing Federal or State laws and regulations that, by statute, the community is required to obey and enforce. Examples of local laws protecting environmental and other natural resources. In addition, variances granted by a community must comply with the provisions of State zoning and enabling legislation and case law.

Minimum Necessary to Afford Relief – §60.6 (a)(4)

A granted variance should be for the minimum deviation from the local requirements that will still alleviate the hardship. In the case of variances to an elevation requirement, this means the community need not grant permission for the applicant to build at grade or even to whatever elevation the applicant proposes, but only to that level that will both provide relief and preserve the integrity of the local ordinance.

For example, if the BFE is ten feet above natural grade, and only a three-foot waiver is necessary to avoid a legitimate hardship, then the community should require that the structure be elevated seven feet. Alternatively, using this example, if the structure had to be built on grade to afford relief, the variance should still stipulate that all utilities and finished interior workings (and other damageable property) be elevated to or above the BFE (or to the maximum extent possible or practically feasible) in order to reduce the potential of flood damage.

The variance must be the absolute minimum necessary to relieve the hardship, which means the absolute maximum to prevent or reduce future flood damages. When a variance waiving the elevation/dry floodproofing requirements is granted, the “minimum necessary” includes the implementation of 1) “wet floodproofing” techniques and/or 2) provisions in §60.3(a)(3) which require the structure to:

“(i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (ii) be constructed with material resistant to flood damage, (iii) be constructed by methods and practices that minimize flood damages, and (iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.”

In summary, very rarely will there be justification to grant a “blanket variance” which waives all NFIP requirements. There will usually be a feasible change that can be done to the structure to reduce the potential for flood damage.

Disclosure – §60.6(a)(5), §60.22 (c)(3)(ii)

Community officials must notify the applicant that the issuance of a variance to construct a structure below BFE will result in increased premium rates for flood insurance and that such construction below BFE increases risks to life and property. Specifically, it is stated in §60.0(a)(5) that:

“a community shall notify the applicant in writing over the signature of the community official that (i) the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage and (ii) such construction below the base flood level increases risks to life and property. Such notification shall be maintained with a record of all variance actions as required in paragraph (a)(6) of this section.”

In addition, under §60.22 (c) (3)(ii), “Planning Considerations in Flood Prone Areas,” it is recommended that a community consider implementing:

“full disclosure to all prospective and interested parties (including but not limited to purchasers and renters) that variances have been granted for certain structures located within flood-prone areas.”



Augusta, ME. An addition to a commercial structure in the floodplain was considered substantial improvement. Flood proofing the older section of the building included retrofitting with a rubber lining. Photo Lou Sidell, Maine Floodplain Management Program

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Such a disclosure is important and necessary to inform subsequent buyers of structures for which a variance was granted to build below BFE. From a public safety standpoint, the prospective buyer has a right to know that the structure will be susceptible to flooding and its occupants subject to risk. From a financial standpoint, the prospective buyer has the right to know that the structure and its contents will be susceptible to damage. All prospective owners of these structures who desire flood insurance should be made aware, before closing, that the premium rates applied to these structures can be extreme, and possibly prohibitively high.

Often the variance applicant does not wish, or is not forced under the mandatory purchase requirement, to purchase flood insurance at the time the variance is granted and high rates are not a problem. Later, especially after a structure has experienced flooding, the owner may decide to purchase flood insurance. In addition, prospective buyers of a structure for which a variance has been granted may desire or be required to purchase flood insurance and may be discouraged from acquiring the structure because of the high rates. This situation can be compounded when an unsuspecting buyer purchases such a structure and later discovers that insurance is required, but at a prohibitive cost. This can result in an economic hardship to an innocent party.

Functionally Dependent Uses – §60.6 (a) (7)

“Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that (i) the criteria of paragraphs (a)(1) through (a)(4) of this [60.6] section are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.”

As defined §59.1, a “functionally dependent use” means a use that cannot perform its intended purpose unless it is located or carried out in close proximity to water. This includes docking facilities necessary for the loading and unloading of cargo and passengers, and shipbuilding and repair facilities. It does not include the long-term storage or related manufactured facilities.

Long-term storage or related manufactured facilities may be located outside of the floodplain or fully comply with all NFIP requirements. These uses are therefore excluded from the definition of “functionally dependent use.” The intent of this is to limit variances only to the practical problems of building and repairing ships, of loading cargo and passengers from vessels, and moving the cargo onto other forms of transportation or to long-term storage facilities that fully comply with NFIP criteria.



In accordance with §60.6(a)(7), communities may grant variances for new or substantially improved construction, and for other development necessary for the conduct of functionally dependent uses. However, all variance criteria must be met. Structures and other development must be protected in ways that minimize flood damages during the base flood.

When applied to some functionally dependent uses such as port facilities, the seafood industry or shipbuilding, NFIP floodplain management criteria can usually be met, with the industry still being able to operate as intended. A 1983 FEMA study entitled “*Effect of Floodplain Regulations on Inland Port Facilities*” identified few instances where ports could not be built in compliance with the regulations while several examples were given of ports that have met all standards.



State Pier 2 - docks and piers are examples of functionally dependent uses. Photos by Bonnie Cowle, Maine Floodplain Management Program.

However, because functionally dependent uses must be located on or adjacent to water to operate, there can be serious practical and operational difficulties resulting in exceptional hardship due to the physical characteristics of the property if a variance is not granted. Typically of concern to the port industry are the elevation and watertight floodproofing requirements in §60.3(d)(3).

In addition, problems occasionally arise in dealing with various V-zone requirements in §60.3(e), especially those covering pile and column construction, breakaway walls, prohibition of fill for structural support, and location of new construction landward of mean high tide. Except for the floodway requirements, there feasible alternative methods for creating no additional threats to public safety and achieving a comparable degree of protection from flood

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damages for the types of structures that normally accompany functionally dependent uses.

Therefore, in accordance with §60.6(a)(4), a variance can be used to address the unique problems of functionally dependent uses if it is for “the minimum necessary to afford relief considering the flood hazard” (§60.6(a)(4)). When evaluating variances for functionally dependent uses, the primary concerns should be that flood damages will be minimized during the base flood and that no additional threats to public safety will be created. A community that varies individual standards for functionally dependent uses, but still uses methods to reduce flood damages to the maximum extent possible or feasible does not jeopardize its NFIP eligibility.

As with existing variance criteria under §60.3(a)(1), no variances for functionally dependent uses may be issued within any designated regulatory floodway if any increases in flood levels would increase potential flood damages to other property owners. In many situations, there will be feasible locations outside of the floodway for a functionally dependent use. In a functionally dependent use has no option but to locate in a floodway, the applicant must either demonstrate that no increase in flood stages will result or must provide additional floodway carrying capacity such as through channel improvements to ensure that no increase in flood stage will result. Communities should be instructed to contact FEMA regional offices for technical assistance if they encounter situations where functionally dependent uses must locate in a floodway, but cannot meet the no-increase-in-flood-stage requirement.

Historic Structures – §60.6(a)

“Variances may be issued for the repair or rehabilitation of historic structures upon a determination that (i) the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and (ii) the variance is the minimum necessary to preserve the historic character and design of the structure.”

The original intent of providing special treatment to historic structures was to comply with the intent of the Historic Preservation Act of 1966 by 1) allowing historic structures to always maintain Pre-FIRM, subsidized insurance rates and, 2) minimizing the adverse impacts of NFIP requirements on the historic integrity of historic structures. However, it is stipulated under §60.6(a) that the variance be the minimum deviation necessary to preserve both the historic character of the structure and its designation as a historic building. It should be noted that communities that do not require historic structures to meet variance criteria may exempt historic structures through the substantial improvement requirement without requiring the minimum necessary to afford relief provision.



(Cape Elizabeth, ME) The Portland Headlight is an example of a historic structure located in a floodplain. The light, housed in one of New England's handsome cast-iron lighthouses, still acts as a navigational aid. The U.S. Coast Guard maintains its equipment.

would otherwise constitute a substantial improvement must not result in the delisting of the structure from its DOI certified, state, or local inventory status. If such alterations cause the structure to lose its official listing or historic status, the structure would no longer be a “historic structure” for the purposes of the NFIP. It would be considered a substantial improvement and, as such, need to comply with the NFIP new construction requirements.

For further background on the pertinent regulations, procedures and adopted nomenclature of the DOI as they pertain to historic structures see **36 CFR 61.4, 61.5, 67.2, 67.4, 67.5, and 67.10.**

Granting a variance should be based on a structure-by-structure review to determine whether elevation (or floodproofing if a non-residential structure is involved) to or above the BFE would destroy the historic character or design of the structure. If so, a variance for that structure may be granted. Variances should never be granted for portions of, or entire historic districts, but only for individual historic structures.

For example, if elevation of a historic structure would destroy its character and cause a loss of its Department of Interior (DOI) designation, an elevation requirement variance may be considered. However, the owner of the structure should still be required, in accordance with §60.6(a)(4), to do the following as feasible: elevate all utilities and finished interior and exterior improvements wherever possible; and/or raise the interior floors to or above the BFE, or to the maximum extent possible (this is often technically feasible in older structures with high ceilings).

Physical alterations made to a “historic structure” that would otherwise constitute a substantial improvement must not result in the delisting of the structure from its DOI certified, state, or local inventory status. If such alterations cause the structure to lose its official listing or historic status, the structure would no longer be a “historic structure” for the purposes of the NFIP. It would be considered a substantial improvement and, as such, need to comply with the NFIP new construction requirements.

----- End of FEMA Variance Guidelines -----

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Records

The Code Enforcement Officer and Board of Appeals must keep a detailed record of the variance procedure. Whenever the Board of Appeals grants a variance, the decision should include findings of fact and reasons for denying or granting the variance. This is important should someone take the community to court.

A variance may also be viewed as a precedent for similar situations. The uniqueness of the situation in question should be well documented so that the future applicants cannot claim that they are treated unfairly (see also *Driscoll v. Gheewalla*, 441 A.2d 1023 [1982]).

The Maine Municipal Association has published a Handbook for Boards of Appeals, which outlines suggested procedures and record keeping. The handbook also contains model forms for Boards of Appeals to use.

It is very important to notify the applicant for a variance (to build below the FPE) about the three things specified in Article X, Section F (Article IX, Section F. in the b, c, and d non-coastal models). Even though a variance to build lower may be granted by the community, the flood insurance rating system does not change. An elevation record must be kept by the community and the insurance agent will report the correct elevation in the application for flood insurance.

Applicants for a variance should be advised to get a flood insurance premium quote before they apply. For example, \$50,000 in flood insurance coverage for a building built five feet below the base flood elevation would cost over \$1,400 a year.



A code inspector measures height of flood vents which allow floodwater to flow underneath a building.

D. Enforcement

The CEO may occasionally become aware of violations either through inspections, during periodic tours of the community, or through the receipt of complaints of alleged violations from citizens or other government officials. An ordinance is worthless if it is not properly enforced. Adequate, uniform and fair enforcement means two things:

1. All new development in the floodplain must have a permit.
2. All development with a permit must be built according to the approved plans.



(Saco, ME) Property owners who elevated home four months prior to April 2007 nor'easter did not sustain damages as a result of that storm. Photo courtesy of Town of Saco Emergency Management.

The best way to ensure the first requirement is to have a large, brightly colored permit form. The sample form in Appendix B can be photocopied on colored cardboard. The form should be displayed at the construction site in full view of a public road. Construction going on without a permit form posted would be seen by police or sheriff's patrols, the animal control officer, or some other local official. These officials should report the violations to the CEO. In many communities, concerned neighbors make such reports.

The best way to ensure the second requirement is for the CEO to inspect the development site. This technique is preferred over waiting until the project is complete, and then expecting an engineer to certify that it is built properly. If the project is not built correctly, it is much easier to correct it before it is finished. It is for this reason that the Model Ordinance suggests a two-part permit process.

The first permit authorizes construction of the foundation and first horizontal floor only. Once the applicant certifies the first floor is at the proper height, a second permit is issued for the construction of the remainder of the building. It will be far less

expensive to correct an error by the excavation contractor or foundation contractor when only the first floor has been constructed, than when the entire building is finished. The Maine Floodplain Management Program strongly urges all Maine communities to adopt the two-part permit procedure contained in the model.

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Violations

When the CEO confirms that floodplain development is underway without a permit or that a project is being built contrary to the permitted plans, the property owner should be notified immediately, in writing, of the nature of the violations, and the CEO should order corrective measures to be taken. In addition to a written notification, the CEO should attempt to contact the property owner or building contractor in person or by telephone to explain his/her concerns.

Some communities include in their ordinances a provision that gives the CEO the power to revoke a development permit or to not issue a use permit. Developing a site or using a building without a permit would therefore be a clear violation of the ordinance.

When the CEO cannot persuade the developer to comply with the ordinance, the municipality must take legal action. Failure to take action makes the ordinance meaningless and violates the community's agreement with the National Flood Insurance Program. The municipality should seek a court order to stop the development. The municipality may also seek a fine and an order for the developer to bring the project into compliance. These recourses are spelled out in Title 30-A MRSA §4452, regarding enforcement of land use laws and ordinances. The Model Ordinance's penalty clause, Article XII (Article XI in the b, c, and d non-coastal models), merely references that statute.

In Maine, CEOs who are certified in Court Rule 80K and have clear written authority from the municipality, are permitted to prosecute land use ordinance violations in District Court without the assistance of the municipal attorney. For more information about 80K training and certification, contact the Code Enforcement Officer Training and Certification Program in the State Planning Office. The Program also has a basic legal issues manual available that offers guidance on enforcement procedures.

Help With Enforcement

The community is not alone in wanting its ordinance enforced. Help in dealing with the violator is available from other sources. Your first point of contact can be the staff of the State Floodplain Management Program. The Coordinator and staff will work with you to determine the best way to deal with the violation problem. In some regions of the state, the Regional Council may be of assistance.

If the project is a building that has been or will be constructed or altered so that it violates the ordinance, the CEO may request that NFIP flood insurance be denied. Section 1316 of the National Flood Insurance Act provides for denial of flood insurance coverage on a building in violation of a local floodplain management ordinance. This technique is especially useful for new construction that will be sold to someone else. Without flood insurance, the buyer will be unable to obtain a mortgage from most lending institutions. For guidance on a Section 1316 declaration, contact the State Floodplain Management Program.

A community that does not adequately enforce the provisions of its adopted floodplain ordinance may be suspended from the flood insurance program by FEMA. The effects are severe. These are outlined below:

1. No new insurance policies can be sold within the community and existing policies will expire as they come up for renewal.
2. A building and its contents located in a special flood hazard area must be protected by the maximum amount available under the NFIP standard flood insurance policy in order to qualify for full disaster assistance.
3. All forms of direct federal financial assistance for acquisition or construction in the special flood hazard area will cease to be available. This includes:
 - Federal disaster relief for flooded buildings and their contents, per above.
 - All federal grants from such agencies as: Environmental Protection Agency, Department of Commerce, Department of Housing and Urban Development, and the Small Business Administration, among others.
 - All federally insured or guaranteed loans, such as: SBA, FHA, VA, and Farmer's Home Administration. In addition, banks must notify new or renewal mortgages in flood hazard areas that federal disaster assistance would be restricted for their properties in the event of a flood.
 - While lending institutions are not prohibited from making conventional mortgages for acquisition or construction purposes within the special flood hazard area of a suspended community; they may be reluctant to issue mortgages on properties without flood insurance protection and to take on the responsibility of a mortgage that cannot be resold on the secondary market to any federal or quasi-federal instrumentality.
4. In communities without a sound floodplain management program, substantially improved or new structures that are allowed to be built with the lowest floor (including basement) below the 100-year flood elevation will have at least a

CHAPTER VI – ADMINISTRATIVE PROCEDURES

one in four chance of being flooded during the next 30 years. Those built significantly below the 100-year level will have an even higher chance of being flooded. In addition to the increased risk of flood damage, the insurance premium for structures built this way is based on the actuarial rate rather than the subsidized rate. Actuarial rates can be as high as 25 dollars per 100 dollars of insurance coverage. This could mean that in the next flood, many people who were allowed to build unsafely in the special flood hazard area may suffer an uninsured loss. Local governments may be held liable, because their actions deny the ability of its citizens to purchase flood insurance and does not take positive steps to reduce the exposure of life and property in the face of authoritative scientific and technical data.



Effective floodplain management ensures the protection and long-term survival of wildlife habitats, floodways, and structures located in communities that would be otherwise negatively affected by nearby lake, riverine, and coastal water bodies. Photos Lou Sidell, Maine State Planning Office.

CHAPTER VII – RELATED IMPORTANT INFORMATION

Chapter Summary Additional information related to floodplain management in general.

A. Emergency Management Institute Training

FEMA provides additional floodplain management training through the Emergency Management Institute (EMI) in Emmitsburg, Maryland. The only cost incurred is for the purchase of a weekly meal ticket. There is no charge for tuition or housing to attend floodplain management courses for state or local government personnel. Airfare reimbursable by FEMA and bus transportation is provided between Washington, D.C. and the EMI campus.

The following floodplain management courses are offered at EMI.

E273 Managing Floodplain Development Through the NFIP

This 4½-day course is designed to provide an organized training opportunity for local officials responsible for administering a local floodplain management ordinance. The course covers the NFIP, floodplain management, maps and studies, ordinance administration, and the relationship between floodplain management and flood insurance. The course is designed for officials with floodplain management experience. Continuing Education Units (CEU's) are available for this course.

E234 Digital Hazard Data Course

This 4½-day course offers floodplain and emergency management personnel the necessary skills and knowledge to use digital flood data and other hazard data. It is **not** intended to make participants technically proficient (experts) in the hands-on use of Geographic Information Systems (GIS). Participants must have basic computer skills and literacy, including knowledge of DOS and Windows. Participants should be aware that many basic GIS concepts will be included in course content and exercises. This training supports FEMA's conversion of the paper Flood Insurance Rate Maps (FIRMs) to a computerized format. Participants must be able to read and interpret a FIRM, use or be planning to use a GIS, and use a personal computer and Windows 95. Continuing Education Units (CEU's) are available for this course.

E278 National Flood Insurance Program/Community Rating System

This 4½-day course covers the CRS, a nationwide initiative of FEMA's National Flood Insurance Program. It describes activities eligible for credit under CRS, how a community applies, and how a community modifies and application to improve its classification. This course is designed for those officials with some floodplain management experience. Continuing Education Units (CEU's) are available for this course.

E279 Retrofitting Floodprone Residential Buildings

This 4½-day course is designed to provide engineering and economic guidance on what constitutes proper retrofitting techniques for flood-prone residential structures. The course will focus on the concepts of floodproofing, regulatory framework, controlling parameters, design practices, and benefit, cost, and technical feasibility analysis. There is a case study design exercise and a written examination. Participants must complete an independent study course before applying for this class. This course is intended for those with engineering, architectural, or building science knowledge. Continuing Education Units (CEU's) are available for this course.

For more information about the EMI and the classes they offer, please contact the Maine Floodplain Management Program, Maine Emergency Management Agency or the FEMA regional office in Boston. Please refer to the technical assistance contact list in the front of the manual for contact information or visit the EMI website at: <http://training.fema.gov/>.



B. Community Rating System (CRS)

A question of fairness was raised several years ago regarding the way flood insurance rates were applied nation wide. Regardless of how well a jurisdiction administered its floodplain regulations, the insurance rates were the same. Is it fair for the residents of a community that undertakes additional mitigation activities to reduce risk of flooding to pay the same rates as those in a community that just adopts and enforces the minimum standards? Many people thought it was not equitable. Those towns that practice good floodplain management reduce their exposure to flooding risk and therefore reduce costs to the National Flood Insurance Fund. Less cost should mean lower rates.

The Community Rating System (CRS) was born out of that discussion. A task force appointed by the Federal Insurance Administrator has developed a list of 18 activities that have been proven to reduce losses. Communities that practice these activities can obtain credit points. Each 500 points that a community earns can translate into a 5% savings on the flood insurance premiums for those in the town that buy flood insurance.

The following activities are eligible for credit points under the Community Rating System:

Activity #	Activity	Brief Description of Activity
310	Elevation Certificates	Credit for maintaining Elevation Certificates for buildings in the floodplain that are new or substantially improved
320	Map Information	Credit for responding to map inquiries from the general public and keeping a record of it
330	Outreach Projects	Credit for disseminating written information about the flood hazard in your community
340	Hazard Disclosure	Credit for informing people that a property is in a floodplain when they first look to buy or rent a property
350	Flood Protection Information	Credit awarded if your local library contains flood-related publications
360	Flood Protection Assistance	Credit awarded for providing technical advice to property owners and publicizing that the service is available
410	Additional Flood Data	Credit awarded for in-depth study of floodplains and/or other target areas
420	Open Space Preservation	Credit for preserving vacant land in the floodplain as open space
430	Higher Regulatory Standards	Credit for regulations that require new development to be protected to one or more standards that are stricter than NFIP minimum requirements
440	Flood Data Maintenance	Credit for keeping the community's floodplain maps and elevation reference data current and useful
450	Stormwater Management	Credit for regulating new development in the watershed (and not just in the floodplain) to minimize the adverse impacts of stormwater runoff
510	Floodplain Management Planning	Credit for preparing, adopting, implementing, evaluating, and updating a comprehensive floodplain management plan
520	Acquisition and Relocation	Credit for acquiring, relocating, or clearing buildings from the floodplain
530	Flood Protection	Credit for buildings that have been floodproofed, elevated, or otherwise modified to protect them from flood damage
540	Drainage System Maintenance	Credit for a program that maintains open channels and storage basins in developed areas
610	Flood Warning System	Credit for a program that provides a timely identification of impending flood threats, disseminates warnings to appropriate floodplain occupants, and coordinates flood response activities
620	Levee Safety	Credit given to communities protected by levees that are properly maintained and operated
630	Dam Safety	Credit for any community in a state with a dam safety program that has submitted to FEMA the necessary documentation of its program
710	Community Growth Adjustment	CRS activities under the 400 series are adjusted to reflect the community's average growth rate

The CRS is only available to those NFIP communities that are in good standing with the Program. If your community is already doing some of these activities, you may be able to help your residents get a discounted rate on flood insurance just by participating in the CRS.

The remaining pages in this section make up the most recent CRS State Profile for Maine (June 2007).

For more information about the CRS, please contact the Maine Floodplain Management Program or Jimmy Chin at the Insurance Services Office (ISO). Please refer to the Technical Assistance Resource list in the front of the handbook for further contact information.

CRS State Profile: Maine

This is a profile for communities in your state that are participating in the Community Rating System (CRS). This profile is intended to provide information to the State NFIP Coordinator and others as general information and for those who may wish to increase community participation in the CRS or to improve the CRS classifications of communities that are already participating.

The CRS provides a discount in flood insurance premiums to property owners in participating communities. CRS credit points are given for a wide range of floodplain management activities, and the total of these points determines the amount of the discount.

The data in this report include community CRS classifications as of May 1, 2007. NFIP Insurance policies in force are as of December 31, 2006. Insurance premiums and CRS discounts are estimates for May 1, 2008 based on policies in force on December 31, 2006.

Figure 1 shows the number of NFIP flood insurance policies in CRS communities in your state. Figure 1 also shows the amount of premium paid for those policies and the savings those property owners will realize from their community's participation in the CRS. Policies for properties within the SFHA in communities in Class 9 and better communities receive a discount of 5% per class. Thus, the premium for a property in the SFHA in a CRS Class 7 community is reduced 15%. The premium for property outside the SFHA is reduced by 10 % for Class 1-6 communities, and 5 % for Class 7-9 communities. Preferred Risk Policies do not receive a CRS discount because they already receive a favorable rate.

Figure 1. Policies, Premiums and CRS Savings for CRS Communities in Maine

POLICIES IN FORCE	PREMIUM	CRS SAVINGS
2,857	\$1,884,100	\$118,793

Figure 2 shows the CRS credit each of your communities is receiving for each activity. For a detailed description of each CRS activity, refer to the 2006 *CRS Coordinator's Manual*. This manual is available for download at <http://training.fema.gov/EMIWeb/CRS/> or it may be ordered at no cost from:

Flood Publications
NFIP/CRS
PO Box 501016
Indianapolis, IN 46250-1016
317-848-2898

Figure 3 shows the current CRS discount being received by NFIP policyholders in your state by community. Altogether, about 5% of all NFIP communities participate, representing about two-thirds of all NFIP policies. If you have communities with a large number of NFIP policies that are not participating in the CRS, you might assist them in applying for the CRS. These discounts are real dollars that are staying in the pockets of your taxpayers.

Additional benefits a community realizes from participation in the CRS include:

1. The CRS floodplain management activities provide enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.
2. A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.
3. Technical assistance in designing/implementing some activities is available at no charge.
4. A CRS community's flood program benefits from having an added incentive to maintain its flood programs over the years. The fact that the community's CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new development, should be taken into account by the governing board when considering such actions. A similar system used in fire insurance rating has had a strong impact on the level of support local governments give to their fire protection programs.
5. Implementing some CRS activities, such as floodplain management planning, can help a community qualify for certain federal assistance programs.

Please note that the community points for each activity may not add up to the total points shown, and these figures may not be those for which your communities are currently receiving CRS credit. This is because some activity credits are increased by a population growth factor. Also, these credits are those currently effective through May 1, 2007 and do not reflect more recent activity. In addition note that the percent savings will not exactly equal the class discounts of 5%, 10%, etc. since the total premium paid includes the federal policy fee which is not discounted. Also, as mentioned above, Preferred Risk Policies do not receive a CRS discount.

Figure 4 shows average credit for each activity for your state's communities and the national average for each activity. You might use this as a way to target activities for which your communities need assistance.

For example, the nation-wide average for Activity 330, Outreach Projects, is 79 points. If your state's average is significantly lower than 79 points, you might consider helping all of your communities with outreach. If your state's average is significantly higher than 79 points, you might want to put your efforts in some other activity. If one or more of your communities is significantly higher in an activity, it might be used as a model for other communities in your state your that activity.

Figure 5 shows the percentage of communities participating in each CRS activity for your state and for the nation. If your state's communities are low in an activity, you might consider what needs to be done to improve this. For example, some states have statutory requirements for regulatory standards that are eligible for CRS credit. If it is verified that communities within those states are applying a state regulatory standard, all of the communities in that state will receive credit for that standard.

If you have any questions on this report, please contact William L. Trakimas, CFM at 317-848-2898.

COMMUNITY RATING SYSTEM

Activity Descriptions

The following is a brief description of the eighteen (18) activities that receive credit under the Community Rating System. Only the activity numbers shown as (310, 320, ...) appear in the charts and graphs on the following pages.

➤ 300 Series - Public information

- 310 - Elevation Certificates
- 320 - Map Information Service
- 330 - Outreach Projects
- 340 - Hazard Disclosure
- 350 - Flood Protection Information
- 360 - Flood Protection Assistance

➤ 400 Series - Mapping and Regulations

- 410- Additional Flood Data
- 420 - Open Space Preservation
- 430 - Higher Regulatory Standards
- 440 - Flood Data Maintenance
- 450 - Stormwater Management

➤ 500 Series - Flood Damage Reduction

- 510- Floodplain Management Planning
- 520 - Acquisition and Relocation
- 530 - Flood Protection
- 540 - Drainage System Maintenance

➤ 600 Series - Flood Preparedness

- 610 - Flood Warning
- 620 - Levee Safety
- 630 - Dam Safety

FIGURE 2.																			
COMMUNITY NAME	C310	C320	C330	C340	C350	C360	C410	C420	C430	C440	C450	C510	C520	C530	C540	C610	C620	C630	TOTAL POINTS
Alfred, Town of	112	70	10	0	25	0	0	771	0	0	17	0	0	0	0	0	0	0	1,005
Arrowsic, Town of	112	140	0	0	0	0	0	716	0	0	0	0	0	0	0	0	0	0	968
Auburn, City of	56	0	14	0	28	0	0	297	89	48	0	0	0	0	0	0	0	0	532
Cape Elizabeth, Town of	112	140	2	0	24	28	0	81	33	70	38	0	0	0	0	0	0	0	528
Farmington, Town of	56	70	4	0	25	0	0	311	0	57	36	0	0	0	0	0	0	0	559
Fort Fairfield, Town of	56	140	2	0	29	0	0	73	90	32	35	0	1308	0	0	0	0	0	1,765
Georgetown, Town of	56	140	0	0	23	0	0	290	78	0	0	0	0	0	0	0	0	0	587
Hallowell, City of	56	140	123	0	28	63	0	359	45	0	0	0	0	0	0	0	0	0	814
Lewiston, City of	56	140	135	0	30	63	0	355	0	76	95	0	0	0	200	0	0	0	1,150
Norridgewock, Town of	112	140	113	0	25	0	0	37	97	0	0	0	0	0	0	0	0	0	524
Ogunquit, Town of	112	140	2	0	21	0	0	788	0	0	0	0	0	0	0	0	0	0	1,063
Old Orchard Beach, Town of	56	140	2	0	25	0	0	525	119	0	0	0	0	0	0	0	0	0	867
Old Town, City of	56	140	2	0	25	0	0	602	30	113	35	0	0	0	0	0	0	0	1,003
Phippsburg, Town of	112	70	4	0	18	0	0	488	0	0	0	0	0	0	0	0	0	0	692
Portland, City of	56	140	2	0	28	0	0	452	147	102	87	0	0	0	0	0	0	0	1,014
Saco, City of	56	140	120	0	26	0	0	440	139	17	40	0	0	0	215	0	0	0	1,193
Skowhegan, Town of	56	140	2	0	25	0	0	599	0	114	36	0	0	0	172	0	0	0	1,144
South Berwick, Town of	56	140	75	0	22	0	0	762	0	0	0	0	5	0	0	0	0	0	1,060
Southwest Harbor, Town of	112	140	0	0	26	0	0	40	157	88	39	0	0	0	0	0	0	0	602
Wells, Town of	56	70	64	0	20	0	0	502	0	95	40	0	5	0	0	0	0	0	852
York, Town of	112	140	84	0	20	0	0	747	54	81	40	0	0	0	0	0	0	0	1,278
Maine Average Credit	77	120	36	0	23	7	0	440	51	43	26	0	63	0	28	0	0	0	914
Maine % of Communities	100%	95%	86%	0%	95%	14%	0%	100%	57%	57%	57%	0%	14%	0%	14%	0%	0%	0%	
National Average Credit	69	138	91	18	27	53	98	196	217	99	123	119	204	97	225	95	167	66	1,285
National % of Communities	100%	95%	87%	63%	88%	49%	39%	92%	95%	78%	82%	27%	19%	8%	76%	36%	0%	90%	

FIGURE 3.			
COMMUNITY NAME	NFIP POLICIES	ANNUAL PREMIUM	CRS REDUCTION
Alfred, Town of	9	\$3,715	\$261
Arrowsic, Town of	0	\$0	\$0
Auburn, City of	103	\$72,188	\$3,551
Cape Elizabeth, Town of	47	\$43,393	\$1,773
Farmington, Town of	26	\$17,092	\$848
Fort Fairfield, Town of	19	\$10,646	\$680
Georgetown, Town of	25	\$17,563	\$766
Hallowell, City of	44	\$46,191	\$2,320
Lewiston, City of	39	\$29,133	\$2,462
Norridgewock, Town of	32	\$16,599	\$725
Ogunquit, Town of	76	\$89,990	\$7,325
Old Orchard Beach, Town of	482	\$211,442	\$9,598
Old Town, City of	55	\$56,549	\$5,347
Phippsburg, Town of	59	\$32,133	\$1,449
Portland, City of	232	\$133,344	\$11,770
Saco, City of	223	\$173,824	\$15,882
Skowhegan, Town of	38	\$25,234	\$2,479
South Berwick, Town of	16	\$9,431	\$724
Southwest Harbor, Town of	29	\$28,744	\$1,273
Wells, Town of	807	\$553,919	\$25,872
York, Town of	496	\$312,970	\$23,689
CRS Communities	2,857	\$1,884,100	\$118,793
Non-CRS Communities	5,128	\$3,558,534	\$0
All Communities	7,985	\$5,442,634	\$118,793

FIGURE 4. STATE AND NATIONAL AVERAGE POINTS PER ACTIVITY

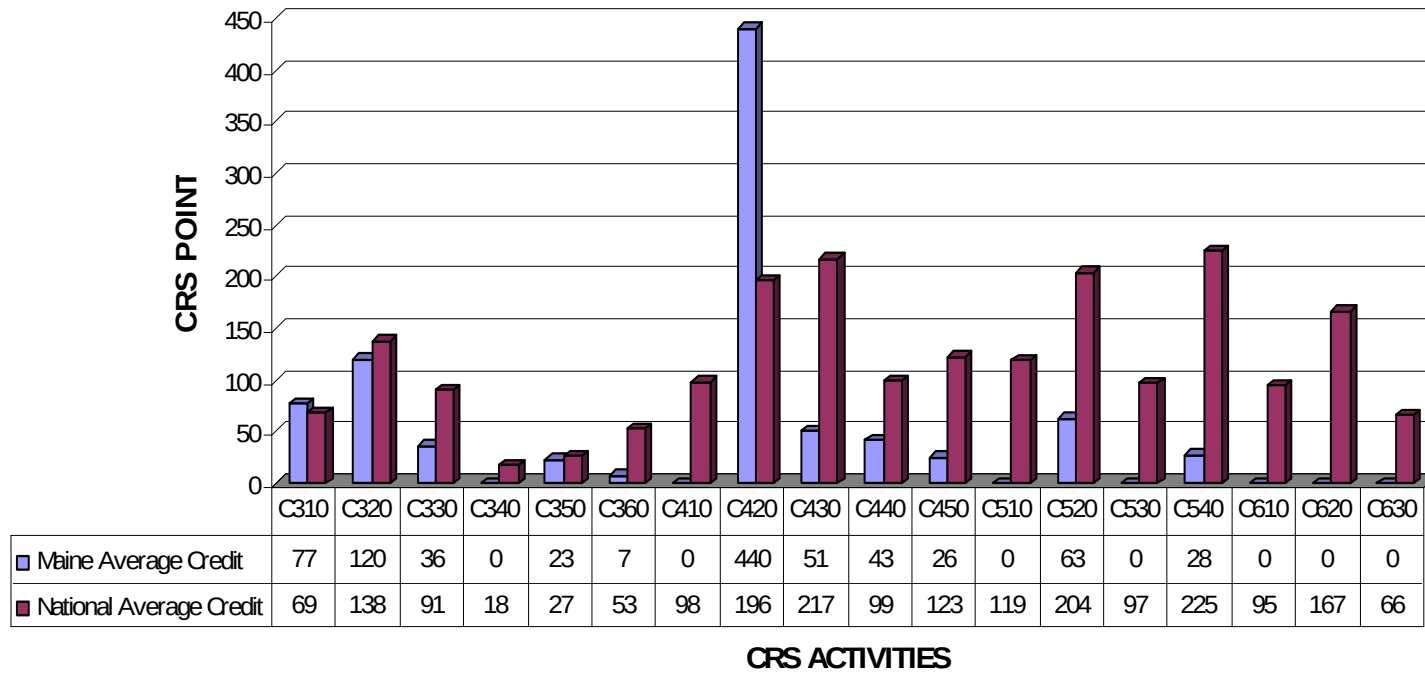
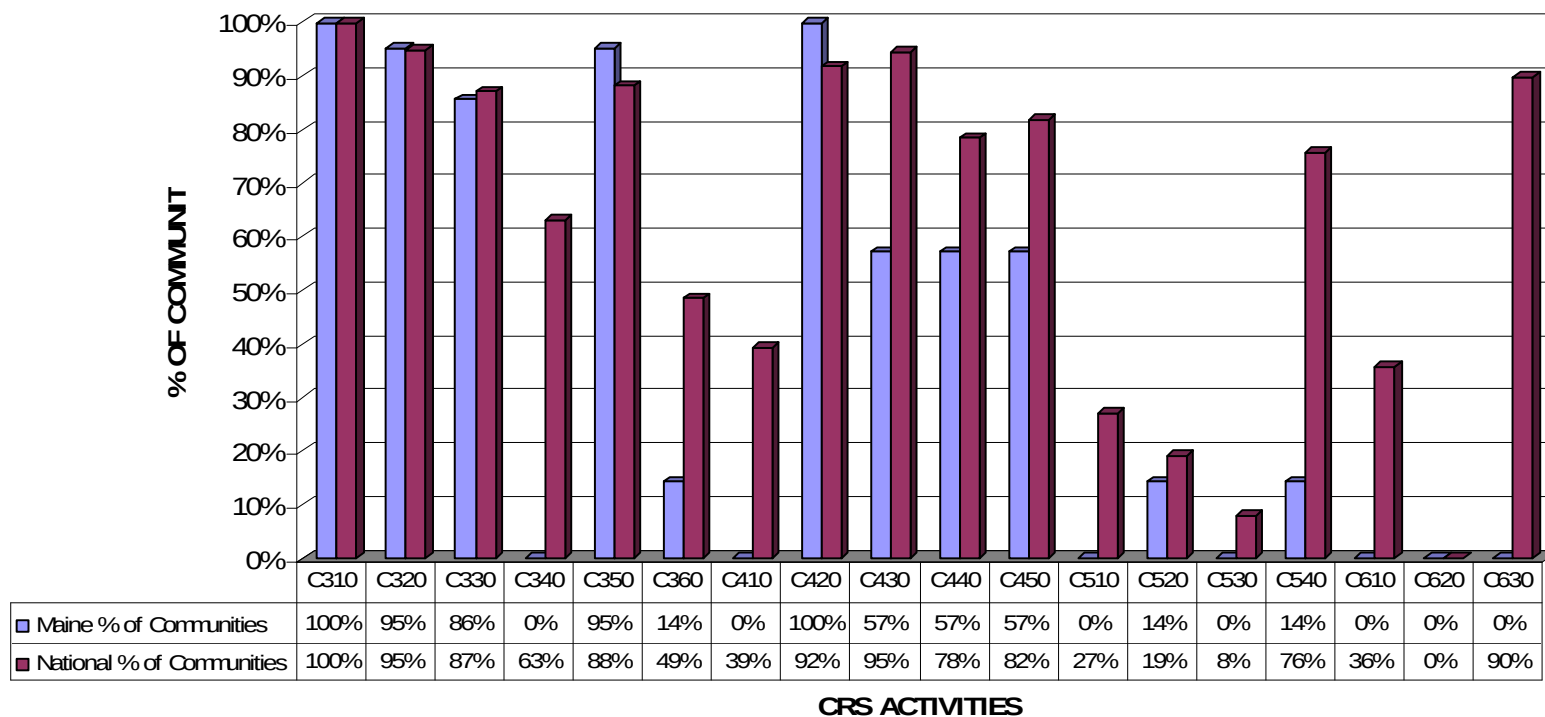


FIGURE 5. STATE AND NATIONAL % OF COMMUNITIES FOR EACH ACTIVITY



Appendix A

Annotated Flood Hazard Development Application & Permits Coastal E Model

Flood Hazard Development Permit Application & Permit Forms

For Communities with Coastal Velocity Zones
[60.3(e)]

CONTENTS

1. Cover Letter (*See Appendix B*)
2. Decision Tree (*See Appendix B*)
3. Flood Hazard Development Permit Application
4. Flood Hazard Development Permit Part I
5. Flood Hazard Development Permit Part II
6. Flood Hazard Development Permit For Minor Development
7. Flood Hazard Development Permit For Conditional Use
8. Flood Hazard Development Permit For Floodproofing Non-Residential Structures
9. V-Zone Certificate (*See Appendix F*)
10. Hydraulic Openings Certificate (*See Appendix F*)
11. Certificate of Compliance
12. FEMA Elevation Certificate (*See Appendix D*)
13. FEMA Floodproofing Certificate (*See Appendix E*)

This document was prepared by the
Maine Floodplain Management Program
Dept. of Agriculture, Conservation & Forestry
93 State House Station
17 Elkins Lane
Augusta, Maine 04333-0093

Phone (207) 287-2801

FLOOD HAZARD DEVELOPMENT APPLICATION

Community Name, Maine

(All applicants must complete entire application)

[60.3(e)]

Application is hereby made for a Flood Hazard Development Permit as required under Article II of the Floodplain Management Ordinance of Community Name, Maine, for development as defined in said ordinance. This permit application does not preclude the need for other municipal permit applications. [Article II, also, NFIP Reg. Part 60.3(a)(1)]

Owner: Article III.A. Address: Article III.A.

Phone No.: Article III.A.

Applicant: Article III.A. Address: Article III.A.

Phone No.: Article III.A.

Contractor: Article III.A. Address: Article III.A.

Phone No.: Article III.A.

LEGAL DESCRIPTION

Is this part of a subdivision? ☐ Yes ☐ No If yes, give the name of the subdivision and lot number:

Subdivision: Recommended but not required by FPMO Lot #: Same

Tax Map: Map required in Article III.B. is not necessarily a Tax Map Lot #: _____

Address: Article III.B.
Street/Road Name

Zip Code: Article III.B.
Town/Zip Code

General explanation of proposed development: Article III.D.

Estimated Value of Proposed Development (all materials and labor): \$ _____ Article III.E. [Necessary to administer Substantial Improvement requirements or Accessory Structure threshold]

Proposed Lowest Floor elevation [for new or substantially improved structure]: Article III.H.3.

OTHER PERMITS

Are other permits required from State or Federal jurisdictions? ☐ Yes ☐ No
If yes, are these other permits attached? ☐ Yes ☐ No ☐ Not Applicable

Federal and State Permits may include but are not limited to: ME/DEP/Natural Resource Protection Act, Site Location of Development Act, Metallic Mineral Exploration, Advanced Exploration and Mining; USACE/Section 9 &10 of the Rivers and Harbors Act/ Section 404 of the Clean Water Act; Federal Energy Regulation Commission.

SEWER AND WATER

Sewage Disposal: ☐ Public ☐ Private [Article III.F., Article VI.C.&D., and NFIP Reg. Part 60.3(a)(6)]
☐ Existing ☐ Proposed ☐ Not Applicable Type _____

Water Supply: ☐ Public ☐ Private [Article III.F., Article VI.B., and NFIP Reg. Part 60.3(a)(5)]

(This section to be completed by Municipal Official)

LOCATION

Flooding Source (name of river, pond, ocean, etc.): Recommended but not required by FPMO

☐ V1-30 Zone ☐ VE Zone ☐ AE Zone ☐ A1-30 Zone ☐ A Zone ☐ AO Zone ☐ AH Zone [Needed to administer Article VI]
☐ FRINGE ☐ FLOODWAY (1/2 width of floodplain in A Zone) [Needed to administer Article VI]

Base Flood Elevation (bfe) at the site _____ NGVD or ☐ NAVD [Required for New Construction or Substantial Improvement]

Lowest floor elevation of proposed or existing structure _____ NGVD or ☐ NAVD [Req. for New Const. or Substantial Improvement]

If proposed development is in an AE or A1-30 Zone and cross section data is available in the Flood Insurance Study, please note the nearest cross section reference letter and elevation of base flood at nearest cross section above and below the site. [Recommended but not required by FPMO]

Cross Section Letter	Base Flood Elevation
Above Site _____	Above Site _____
Below Site _____	Below Site _____

Basis of unnumbered A Zone bfe determination: [Article V.B., also NFIP Reg Part 60.3(b)(4)]

- | | |
|--|---|
| ☐ From a Federal Agency: | ☐ USGS ☐ USDA/NRCS ☐ USACE ☐ Other _____ |
| ☐ From a State Agency: | ☐ MDOT ☐ Other _____ |
| ☐ Established by Professional Land Surveyor | |
| ☐ Established by Professional Engineer | ☐ HEC/RAS ☐ HEC II ☐ HY 7 ☐ TR20 ☐ TR55 ☐ Quick-2 |
| | ☐ Other _____ |
| ☐ Highest Known Water Level | |
| ☐ Other (Explain) _____ | |

VALUE

If the development involves work on an existing structure, enter the **Market Value** of existing structure before improvements:

\$ _____ What is the value of the improvements (all materials and labor)? \$ _____

[Needed to administer Substantial Improvement requirements of Article VI].

☐ New Construction or Substantial Improvement ☐ Minor improvement or minor addition to existing development

TYPE OF DEVELOPMENT [Article III.D., also Article XIII Definition of Development]

Check the appropriate box to the left of the type(s) of development requested and complete information for each applicable line:

☐ 1. Residential Structure	Dimensions	Cubic Yards
☐ 1a. New Structure	_____	_____
☐ 1b. Add to Structure	_____	_____
☐ 1c. Renovations/repairs/maintenance	_____	_____
☐ 2. Non-Residential Structure		
☐ 2a. New Structure	_____	_____
☐ 2b. Add to Structure	_____	_____
☐ 2c. Renovations/repairs/maintenance	_____	_____
☐ 2d. Floodproofing	_____	_____
☐ 3. Accessory Structure	_____	_____
☐ 4. Functionally Dependent Use:		Number of Acres
☐ 4a. Dock	_____	_____
☐ 4b. Pier	_____	_____
☐ 4c. Boat Ramp	_____	_____
☐ 4d. Other	_____	_____
☐ 5. Paving	_____	_____
☐ 6. Conditional Use (Lobster/Fish Shed seaward of mean high tide)	_____	_____
☐ 7. Filling ¹	_____	_____
☐ 8. Dredging	_____	_____
☐ 9. Excavation	_____	_____
☐ 10. Levee	_____	_____
☐ 11. Drilling	_____	_____
☐ 12. Mining	_____	_____
☐ 13. Dam: Water surface to be created	_____	_____
☐ 14. Water Course Alteration <u>[Article III.L., also NFIP Reg 60.3(b)(6)]</u>	_____	_____
Note: Detailed description must be attached with copies of all applicable notifications, state and federal permits.		
☐ 15. Storage of equipment or materials	_____	_____
☐ 16. Sewage Disposal System	_____	_____
☐ 17. Water Supply System	_____	_____
☐ 18. Other: Explain	_____	_____

Note: Conditional Use requires add'l. information due to specific

¹ Certain prohibitions apply in Velocity Zones

standards, public hearing, and Planning Board review.

Attach a Site Plan – Drawn to scale with north arrow. [Article III.C.]

- Show property boundaries, floodway, and floodplain lines.
- Show dimensions of the lot.
- Show dimensions and location of existing and/or proposed development on the site.
- Show areas to be cut and filled.

Attach Statement – describing in detail how each applicable development standard in Article VI will be met. [Article III.M.]

For New Construction or Substantial Improvement also show:

- Existing and proposed grade elevations adjacent to the walls of the structure done by a Professional land Surveyor, Architect, or Engineer.
- Location and elevation of temporary elevation reference marks on the site.

Special Note:

Substantial Improvement is defined as any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. Please refer to the floodplain management ordinance, Article XIV, for more complete definitions of New Construction and Substantial Improvement.

Structures in Velocity Zones are not permitted on fill or excavations. Structures must be built on open foundation systems, i.e., columns, piles, posts. Certification of structural design, specifications, plans and construction methods completed by a Professional Engineer or Architect shall accompany the application as required in Article VI.L.3. of the floodplain management ordinance. [Article VI.P.]

The applicant understands and agrees that:

- The permit applied for, if granted, is issued on the representations made herein;
- Any permit issued may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- Any permit issued on this application will not grant any right or privilege to erect any structure or sue any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The applicant hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain management Ordinance;
- If issued, the permit form will be posted in a conspicuous place on the premises in plain view; and,
- If issued, the permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this application are a true description of the existing property and the proposed development project.

Owner: Recommended but not required by FPMO Date: Recommended but not required by FPMO
Signature

or

Authorized Agent: Recommended but not required by FPMO Date: Recommended but not required by FPMO
Signature

[Article IV & V] (This section to be completed by Municipal Official)

Date: Submitted _____; Fee Paid _____; Reviewed by CEO _____; Reviewed by Planning Board _____

Permit # _____ Issued by _____ Date _____

FLOOD HAZARD DEVELOPMENT PERMIT

PART I

Community Name, Maine

(For New Construction or Substantial Improvements)

For New Construction or Substantial Improvement of any structure, this Flood Hazard Development Permit allows construction only up to the establishment of the lowest floor. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance. Once the lowest floor is established, the permittee must provide an Elevation Certificate establishing the as built lowest floor elevation. When the Code Enforcement Officer finds the documentation in the Elevation Certificate to be in compliance with the Floodplain Management Ordinance, the Part II Flood Hazard Development Permit shall be issued. The Part II Permit must be issued in order for construction to continue. [Article V.F.1.]

A Part I Flood Hazard Development Permit is hereby issued as provided under Article V.F. of the Floodplain Management Ordinance of Community Name, Maine, for development as defined in said ordinance.

Tax Map: _____ Lot #: _____ [Recommended but not required by FPMO]

Project Description: _____ [Recommended but not required by FPMO]

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ [Recommended but not required by FPMO] Date: _____ [Recommended but not required by FPMO]
Signature

or

Authorized Agent: _____ [Recommended but not required by FPMO] Date: _____ [Recommended but not required by FPMO]
Signature

Issued by: _____ [Recommended but not required by FPMO] Date: _____ [Recommended but not required by FPMO]

Permit #: _____ [Recommended but not required by FPMO]

FLOOD HAZARD DEVELOPMENT PERMIT

PART II

Community Name, Maine

(For completion of New Construction or Substantial Improvements)

The following information has been submitted and found compliant with the Development Standards of the Floodplain Management Ordinance:

☐ FEMA Elevation Certificate Form 81-31 [Article V.F.1.]

For construction in Zones V1-30 and VE only:

☐ Review of the structural design, specifications, plans, and construction methods by a Professional Engineer or Architect certifying that they meet or exceed the technical criteria contained in the FEMA/Coastal Construction Manual and are in accordance with accepted standard of practice for meeting the criteria of Article VI.P.2. [Article VI.P.2&3.]

A Part II Flood Hazard Development Permit is hereby issued as provided under Article V.F. of the Floodplain Management Ordinance of Community Name, Maine, for development as defined in said ordinance.

Tax Map: _____ Lot #: _____ [Recommended but not required by the FPMO]

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the elevation certificate;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO
Signature

or

Authorized Agent: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO
Signature

Issued by: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO

Permit #: _____ Recommended but not required by the FPMO

FLOOD HAZARD DEVELOPMENT PERMIT

For Minor Development

Community Name, Maine

(For Development not considered a Substantial Improvement)

This Flood Hazard Development Permit allows minor development as provided in Article V.F.3. of the Floodplain Management Ordinance of Community Name, Maine, for development in a Special Flood Hazard Area as defined in said ordinance. Development authorized by this permit must be adequately anchored to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, be constructed with materials resistant to flood damage and be constructed by methods and practices that minimize flood damage. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance.

Tax Map: _____ Lot #: _____

[Recommended but not required by the FPMO]

Project Description: _____

[Recommended but not required by the FPMO]

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____
Signature

Date: [Recommended but not required by the FPMO]

or

Authorized Agent: _____
Signature

Date: [Recommended but not required by the FPMO]

Issued by: _____

Date: [Recommended but not required by the FPMO]

Permit #: _____

FLOOD HAZARD DEVELOPMENT PERMIT

For Conditional Use

Community Name, Maine

This Flood Hazard Development Permit allows new construction or substantial improvement of any structure which has been reviewed and approved, or approved with conditions, by the Planning Board as a Conditional Use, only as provided for in the Floodplain Management Ordinance of Community Name, Maine, and pursuant to Article VII of the Ordinance. Development authorized by this permit must meet the conditional use requirements specified in Article VI.P.7. of the Ordinance. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance.

Tax Map: _____ Lot #: _____

[Recommended but not required by the FPMO]

Project Description: _____

[Recommended but not required by the FPMO]

Project Condition(s): _____

[Recommended but not required by the FPMO]

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ [Recommended but not required by the FPMO]

Date: [Recommended but not required by the FPMO]

Signature

or

Authorized Agent: _____ [Recommended but not required by the FPMO]

Date: [Recommended but not required by the FPMO]

Signature

Issued by: _____ [Recommended but not required by the FPMO]

Date: [Recommended but not required by the FPMO]

Permit #: _____ [Recommended but not required by the FPMO]

FLOOD HAZARD DEVELOPMENT PERMIT

For FLOODPROOFING

Non-Residential Structures

Community Name, Maine

This Flood Hazard Development Permit allows Floodproofing of Non-residential Structures in a Special Flood Hazard Area. Floodproofing means any combination of structural and non-structural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and contents. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance. [Article V.F.2.]

If the floodproofing is to serve as a method of bringing a structure into compliance with National Flood Insurance Program (NFIP) elevation requirements:

- All standards required by NFIP 44 CFR 60.3(c)(3) and all standards required by Article VI.G. of the Floodplain Management Ordinance must be met; and
- The application for this permit must include a FEMA Floodproofing Certificate (Form 81-65) signed by a registered professional engineer or architect certifying that the design and methods of construction will be in accordance with accepted standards of practice for meeting the provisions of NFIP 44 CFR 60.3(c)(3) as well as Article VI.G. of the Floodplain Management Ordinance. [Article VI.G. and NFIP Reg Part 60.3(c)(4)]

A Flood Hazard Development Permit for Floodproofing is hereby issued as provided under Article V.F. of the Floodplain Management Ordinance of Community Name, Maine, for development as defined in said ordinance.

Tax Map: _____ Lot #: _____ [Recommended but not required by the FPMO]

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO
Signature

or

Authorized Agent: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO
Signature

Issued by: _____ Recommended but not required by the FPMO Date: Recommended but not required by the FPMO

Permit #: _____ Recommended but not required by the FPMO

CERTIFICATE OF COMPLIANCE

Community Name, Maine

Owner: Recommended but not required by the FPMOAddress: Recommended but not required by the FPMO

Tax Map: _____ Lot #: _____

[Recommended but not required by the FPMO]

Location of Property: _____

[Recommended but not required by the FPMO]

The development described above has been constructed in compliance with the Floodplain Management Ordinance for the
Community Name, Maine. [Article VIII]

A variance ☐ was ☐ was not required for this development.

This determination is based on: ☐ Elevation Certificate data ☐ Floodproofing Certificate data
provided by: [check appropriate box] [Required for New Construction or Substantial Improvement]

☐ Professional land Surveyor

Name: _____

Address: _____

License #: _____

☐ Architect

Name: _____

Address: _____

License #: _____

☐ Professional Engineer

Name: _____

Address: _____

License #: _____

☐ On Site Inspection by Code Enforcement Officer: Recommended but not required by the FPMO
Code Enforcement Officer (please print)

Signature: Recommended but not required by the FPMO Date: Recommended but not required by the FPMO

Flood Hazard Development Permit #: _____

National Flood Insurance Program

V-ZONE CERTIFICATE

[A V-Zone certification is required by the FPMO at Article VI.P.2.c]

Name _____ Policy Number (Insurance Co. Use) _____
Building Address or
Other Description _____
City _____ State _____ Zip Code _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community Number _____ Panel Number _____ Suffix _____ Date of FIRM Index _____ FIRM Zone _____

SECTION II: Elevation Information

NOTE: This Certificate does not substitute for an Elevation Certificate

1. Elevation of the Bottom of Lowest Horizontal Structural Member..... _____ feet (NGVD)
2. Base Flood Elevation (BFE)..... _____ feet (NGVD)
3. Elevation of Lowest Adjacent Grade..... _____ feet (NGVD)
4. Approximate Depth of Anticipated Scour/Erosion used for Foundation Design..... _____ feet (NGVD)
5. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade..... _____ feet (NGVD)

SECTION III: V-Zone Certification Statement

NOTE: This section must be certified by a registered engineer or architect

I certify that I have developed or reviewed the structural design, plans, and specifications for construction and that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the following provisions:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the BFE; and
- The pile and column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of the wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood. Wind loading values used are those required by the applicable State or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

SECTION IV: Breakaway Wall Certification Statement

NOTE: This section must be certified by a registered engineer or architect

when breakaway walls exceed a design safe loading resistance of 20 pounds per square foot

I certify that I have developed or reviewed the structural design, plans, and specifications for construction and that the design and methods of construction to be used for the breakaway walls are in accordance with accepted standards of practice for meeting the following provisions:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (wind and water loading values to be used are defined in Section III).

SECTION V: Certification

Signature below certifies: _____ Section III; _____ Section IV

Certifier's Name _____
Title _____ License Number _____
Street Address _____
City _____ State _____ Zip Code _____

Signature _____ Date _____ Telephone Number _____

National Flood Insurance Program

Hydraulic Openings Certificate

[A Hydraulic Openings certification is required by the FPMO at Article III.K.3. for all engineered hydraulic openings other than those specified by the FPMO at Article VI.L.2.b.]

Project Name

I, _____, do hereby certify that the opening(s) designed for installation in the aforementioned building have been engineered to allow for the automatic equalizing of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater during floods up to and including the base (100-year) flood.

[Guidance on engineered openings is available in FEMA's Technical Bulletin 1-93, *Openings in Foundation Walls.*]

Certifier's Name

Title

Type of License

License Number

Company Name

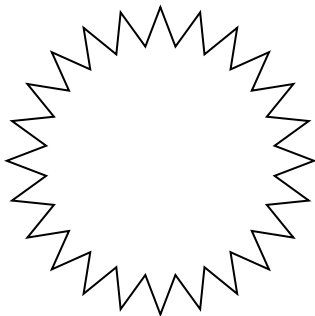
Street Address

City, State, Zip

Telephone Number

Signature

Date



PROFESSIONAL SEAL



FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

National Flood Insurance Program ELEVATION CERTIFICATE

Paperwork Reduction Act Notice

Public reporting burden for this data collection is estimated to average 3.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

Privacy Act Statement

Authority: Title 44 CFR § 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of estimate the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or may be subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

Purpose of the Elevation Certificate

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate Post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. The Elevation Certificate is not required for Pre-FIRM buildings unless the building is being rated under the optional Post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management regulations that specify minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in FEMA Publication 467-1, Floodplain Management Bulletin: Elevation Certificate, available on FEMA's website at <http://www.fema.gov/library/viewRecord.do?id=1727>.

ELEVATION CERTIFICATE

IMPORTANT: Follow the instructions on pages 1–9.

OMB No. 1660-0008
Expiration Date: July 31, 2015

SECTION A – PROPERTY INFORMATION

FOR INSURANCE COMPANY USE		
A1. Building Owner's Name	Policy Number:	
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.	Company NAIC Number:	
City	State	ZIP Code
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)		
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____		
A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983		
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.		
A7. Building Diagram Number _____		
A8. For a building with a crawlspace or enclosure(s):		A9. For a building with an attached garage:
a) Square footage of crawlspace or enclosure(s) _____ sq ft		a) Square footage of attached garage _____ sq ft
b) No. of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____		b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____
c) Total net area of flood openings in A8.b _____ sq in		c) Total net area of flood openings in A9.b _____ sq in
d) Engineered flood openings? ☐ Yes ☐ No		d) Engineered flood openings? ☐ Yes ☐ No

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number			B2. County Name		B3. State
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: ☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other/Source: _____					
B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No Designation Date: _____ / _____ / _____ ☐ CBRS ☐ OPA					

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction
*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations in items a) through h) below. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	_____ . _____	☐ feet ☐ meters
b) Top of the next higher floor	_____ . _____	☐ feet ☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)	_____ . _____	☐ feet ☐ meters
d) Attached garage (top of slab)	_____ . _____	☐ feet ☐ meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	_____ . _____	☐ feet ☐ meters
f) Lowest adjacent (finished) grade next to building (LAG)	_____ . _____	☐ feet ☐ meters
g) Highest adjacent (finished) grade next to building (HAG)	_____ . _____	☐ feet ☐ meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	_____ . _____	☐ feet ☐ meters

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available.
I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

☐ Check here if comments are provided on back of form. Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No
☐ Check here if attachments.

Certifier's Name		License Number	
Title	Company Name		
Address	City	State	ZIP Code
Signature	Date	Telephone	

PLACE
SEAL
HERE

ELEVATION CERTIFICATE, page 2

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:	
City	State	ZIP Code	Company NAIC Number:	

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments

Signature Date

SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).

a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 8–9 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____ . _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community’s floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER’S REPRESENTATIVE) CERTIFICATION

The property owner or owner’s authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner’s Authorized Representative’s Name

Address City State ZIP Code

Signature Date Telephone

Comments

☐ Check here if attachments.

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community’s floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4–G9) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
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G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: _____ . _____ ☐ feet ☐ meters Datum _____

G9. BFE or (in Zone AO) depth of flooding at the building site: _____ . _____ ☐ feet ☐ meters Datum _____

G10. Community’s design flood elevation: _____ . _____ ☐ feet ☐ meters Datum _____

Local Official’s Name Title

Community Name Telephone

Signature Date

Comments

☐ Check here if attachments.

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number:

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; “Front View” and “Rear View”; and, if required, “Right Side View” and “Left Side View.” When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number:

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.

Instructions for Completing the Elevation Certificate

OMB No. 1660-0008
Expiration Date: July 31, 2015

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

SECTION A – PROPERTY INFORMATION

Items A1–A4. This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

Item A5. Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. When the latitude and longitude are provided by a surveyor, check the "Yes" box in Section D and indicate the method used to determine the latitude and longitude in the Comments area of Section D. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

Item A6. If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least 2 photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. To the extent possible, these photographs should show the entire building including foundation. If the building has split-level or multi-level areas, provide at least 2 additional photographs showing side views of the building. In addition, when applicable, provide a photograph of the foundation showing a representative example of the flood openings or vents. All photographs must be in color and measure at least 3" × 3". Digital photographs are acceptable.

Item A7. Select the diagram on pages 7–9 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a–h. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

Item A8.a Provide the square footage of the crawlspace or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawlspace or enclosure(s). Examples of elevated buildings constructed with crawlspace and enclosure(s) are shown in Diagrams 6–9 on pages 8–9. Diagram 2, 4, or 9 should be used for a building constructed with a crawlspace floor that is below the exterior grade on all sides.

Items A8.b–d Enter in Item A8.b the number of permanent flood openings in the crawlspace or enclosure(s) that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A8.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the crawlspace or enclosure(s) have no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter “0” (zero) in Items A8.b–c.

Item A9.a Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

Items A9.b–d Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. (A permanent flood opening is a flood vent or other opening that allows the free passage of water automatically in both directions without human intervention.) If the interior grade elevation is used, note this in the Comments area of Section D. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the net area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. Indicate in Item A9.d whether the flood openings are engineered. If applicable, attach a copy of the Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES), if you have it. If the garage has no permanent flood openings, or if the openings are not within 1.0 foot above adjacent grade, enter “0” (zero) in Items A9.b–c.

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building’s location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community’s FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the county or new county, if necessary, in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

If the map in effect at the time of the building’s construction was other than the current FIRM, and you have the past map information pertaining to the building, provide the information in the Comments area of Section D.

Item B1. NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a “community” is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP Community Status Book, available on FEMA’s web site at <http://www.fema.gov/fema/csb.shtm>, or call 1-800-358-9616.

Item B2. County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter “unincorporated area.” For an independent city, enter “independent city.”

Item B3. State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

Items B4–B5. Map/Panel Number and Suffix. Enter the 10-character “Map Number” or “Community Panel Number” shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the “Map Number” is the letter “C” followed by a 4-digit map number. For maps not in a county-wide format, enter the “Community Panel Number” shown on the FIRM.

Item B6. FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

Item B7. FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

Item B8. Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter “A” or “V” are considered Special Flood Hazard Areas. The flood zones are A, AE, A1–A30, V, VE, V1–V30, AH, AO, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

Item B9. Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than 1 flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1–A30, AE, AH, V1–V30, VE, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community’s floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Item B10. Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. Information about CBRS areas and OPAs may be obtained on the FEMA web site at <http://www.fema.gov/business/nfip/cbrs/cbrs.shtm>.

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

Complete Section C if the building is located in any of Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawlspaces to shoot the elevation of the crawlspace floor. If access to the crawlspace is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawlspace to the “next higher floor,” and then subtract the crawlspace height from the elevation of the “next higher floor.” If there is no access to the crawlspace, use the exterior grade next to the structure to measure the height of the crawlspace to the “next higher floor.”
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawlspace floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawlspace floor to the next higher floor, try to verify this by looking inside the crawlspace through any openings or vents.

In all 3 cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

Item C1. Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first 2 choices, a post-construction Elevation Certificate will be required

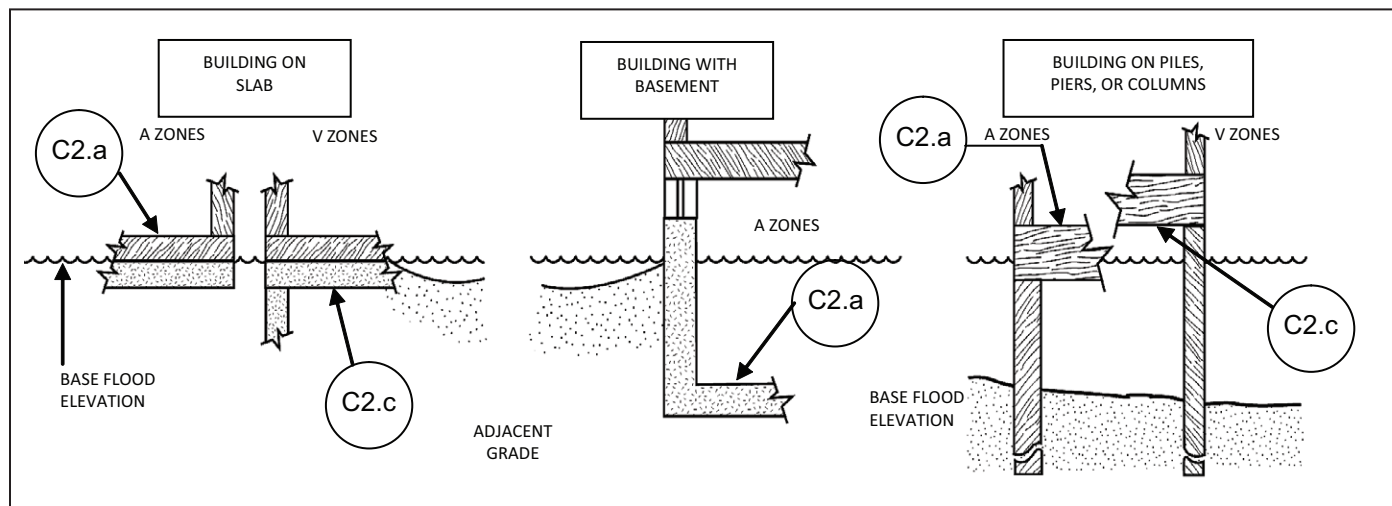
when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a–h. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select “Finished Construction” only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Item C2. A field survey is required for Items C2.a–h. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other unique identifier assigned by the maintainer of the benchmark. For GPS survey, indicate the benchmark used for the base station, the Continuously Operating Reference Stations (CORS) sites used for an On-line Positioning User Service (OPUS) solution (also attach the OPUS report), or the name of the Real Time Network used.

Also provide the vertical datum for the benchmark elevation. All elevations for the certificate, including the elevations for Items C2.a–h, must use the same datum on which the BFE is based. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. Show the datum conversion, if applicable, in the Comments area of Section D.

For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a–h to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items C2.a–d Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7) in Items C2.a–c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a–h. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawlspace, Diagrams 8 and 9, enter the elevation of the top of the crawlspace floor in Item C2.a, whether or not the crawlspace has permanent flood openings (flood vents). If any item does not apply to the building, enter “N/A” for not applicable.



Item C2.e Enter the lowest platform elevation of at least 1 of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type and its general location, e.g., on floor inside garage or on platform affixed to exterior wall, in the Comments area of Section D or Section G, as appropriate. If this item does not apply to the building, enter “N/A” for not applicable.

Items C2.f–g Enter the elevation of the ground, sidewalk, or patio slab immediately next to the building. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

Item C2.h Enter the lowest grade elevation at the deck support or stairs. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, openings, or other relevant information not specified on the front.

SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1–E4 is based on the “natural grade.”

Items E1.a and b Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community’s floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

Item E2. For Building Diagrams 6–9 with permanent flood openings (see pages 8–9), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

Item E3. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter “N/A” for not applicable.*

Item E4. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter “N/A” for not applicable.*

Item E5. For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community’s floodplain management ordinance.

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner’s representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner’s representative who provided the information on the certificate.

SECTION F – PROPERTY OWNER (OR OWNER’S REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner’s representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner’s representative who provided the information on the certificate.

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/A1–A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3** if the information in Items G4–G10 has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4–G10 provide a way to document these determinations.

Item G4. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G5. Date Permit Issued. Enter the date the permit was issued for the building.

Item G6. Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

Item G7. New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G8. As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

Item G9. BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

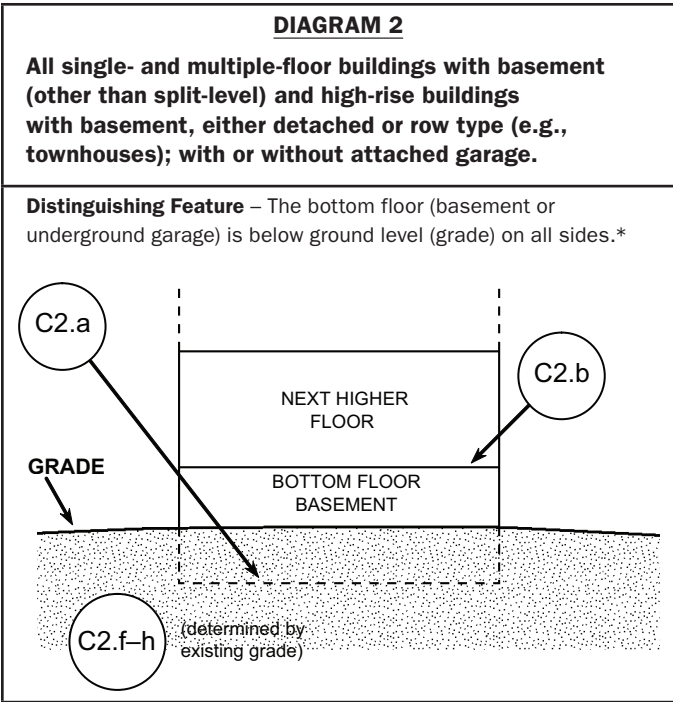
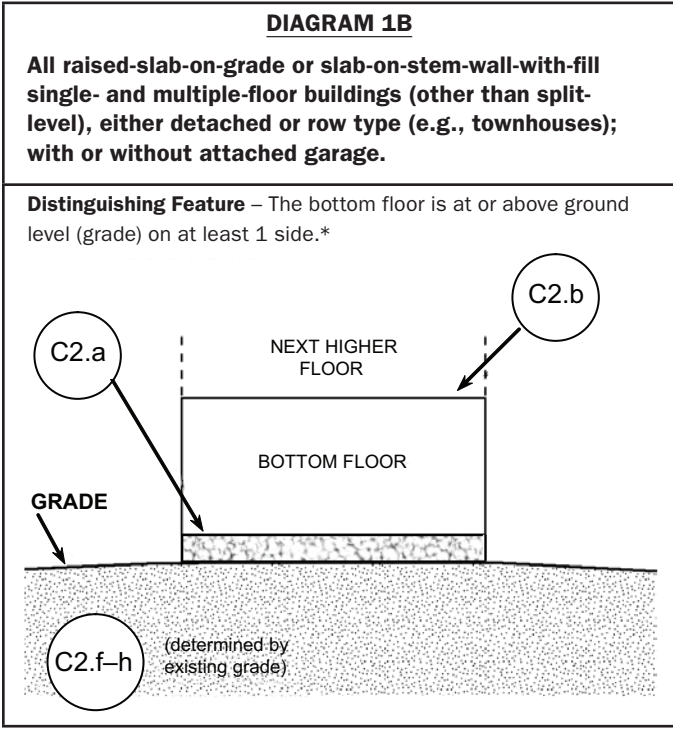
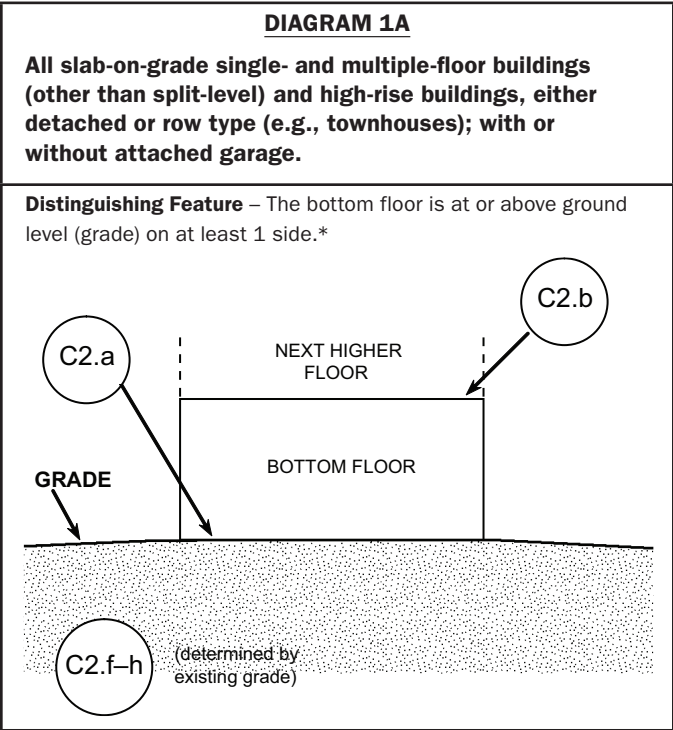
Item G10. Community's design flood elevation. Enter the elevation (including freeboard above the BFE) to which the community requires the lowest floor to be elevated. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

Building Diagrams

The following diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7, the square footage of crawlspace or enclosure(s) and the area of flood openings in square inches in Items A8.a–c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a–c, and the elevations in Items C2.a–h.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).

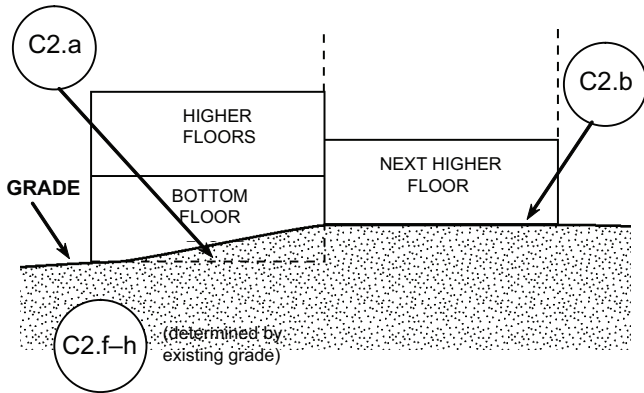


* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

DIAGRAM 3

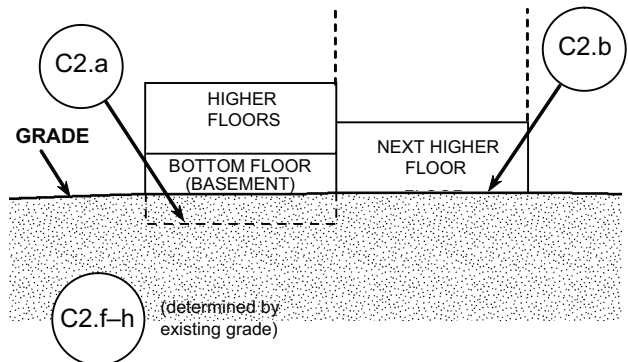
All split-level buildings that are slab-on-grade, either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (excluding garage) is at or above ground level (grade) on at least 1 side.*

**DIAGRAM 4**

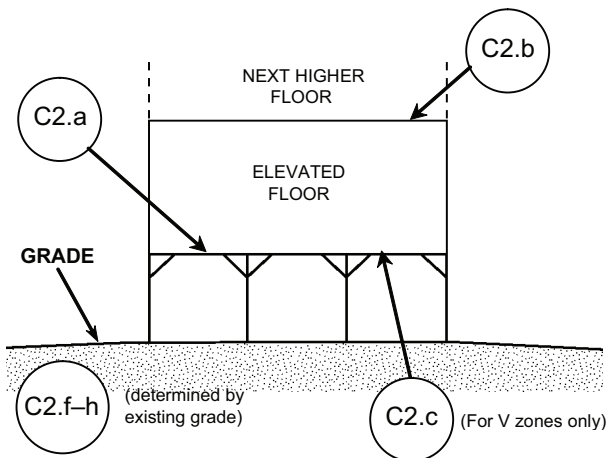
All split-level buildings (other than slab-on-grade), either detached or row type (e.g., townhouses); with or without attached garage.

Distinguishing Feature – The bottom floor (basement or underground garage) is below ground level (grade) on all sides.*

**DIAGRAM 5**

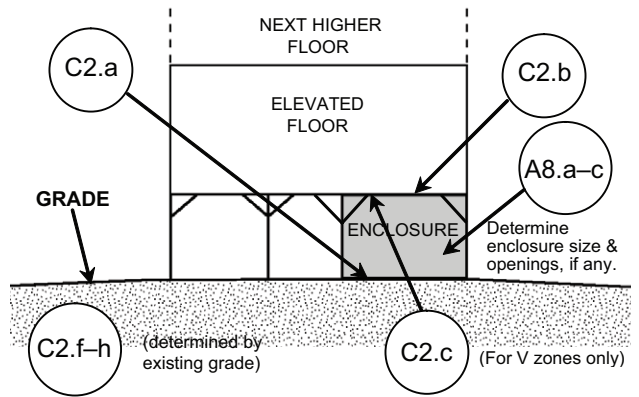
All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is open, with no obstruction to flow of floodwaters (open lattice work and/or insect screening is permissible).

**DIAGRAM 6**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



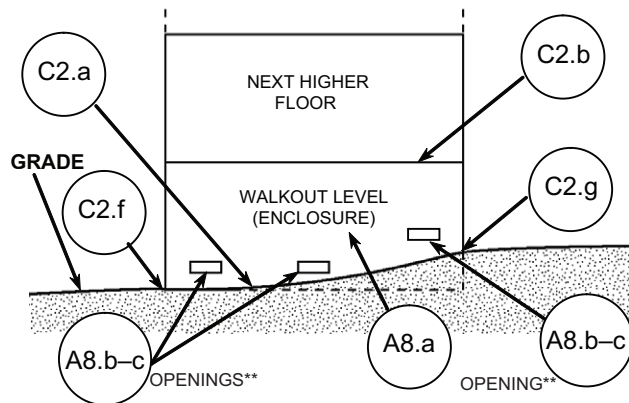
* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

** An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of 2 openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than 1 square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 2 sides of the enclosed area. If a building has more than 1 enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.

DIAGRAM 7

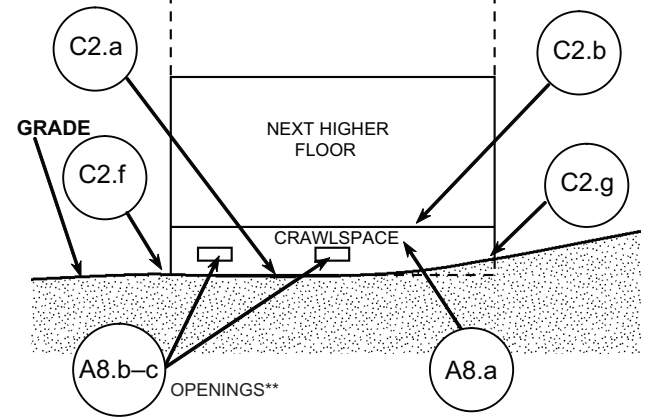
All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least 1 side is at or above grade. The principal use of this building is located in the elevated floors of the building.

Distinguishing Feature – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings** present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.

**DIAGRAM 8**

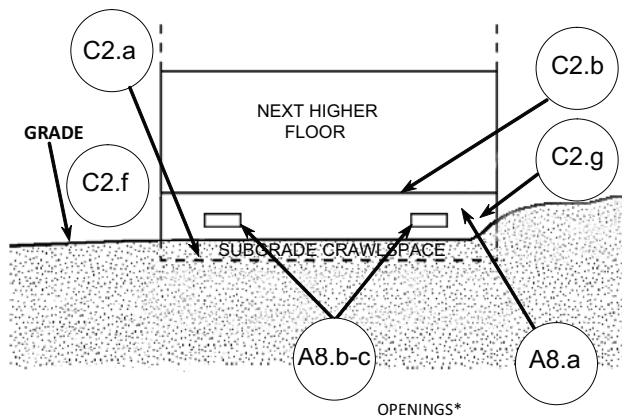
All buildings elevated on a crawlspace with the floor of the crawlspace at or above grade on at least 1 side, with or without an attached garage.

Distinguishing Feature – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawlspace is with or without openings** present in the walls of the crawlspace. Indicate information about crawlspace size and openings in Section A – Property Information.

**DIAGRAM 9**

All buildings (other than split-level) elevated on a sub-grade crawlspace, with or without attached garage.

Distinguishing Feature – The bottom (crawlspace) floor is below ground level (grade) on all sides.* (If the distance from the crawlspace floor to the top of the next higher floor is more than 5 feet, or the crawlspace floor is more than 2 feet below the grade [LAG] on all sides, use Diagram 2.)



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

** An "opening" is a permanent opening that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of 2 openings is required for enclosures or crawlspaces. The openings shall provide a total net area of not less than 1 square inch for every square foot of area enclosed, excluding any bars, louvers, or other covers of the opening. Alternatively, an Individual Engineered Flood Openings Certification or an Evaluation Report issued by the International Code Council Evaluation Service (ICC ES) must be submitted to document that the design of the openings will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening; openings may be installed in doors. Openings shall be on at least 2 sides of the enclosed area. If a building has more than 1 enclosed area, each area must have openings to allow floodwater to directly enter. The bottom of the openings must be no higher than 1.0 foot above the higher of the exterior or interior grade or floor immediately below the opening. For more guidance on openings, see NFIP Technical Bulletin 1.

Checking Elevations in the Field

APPENDIX C - CHECKING ELEVATIONS IN THE FIELD

Code enforcement officers may want to check lowest floor elevations in the field using the system described below. Three pieces of equipment are needed: a level, a rod, and a record book. The first two can usually be found in the local street or highway department. If not, the consulting engineer or a neighboring community may loan one. If one is needed all the time, new levels can be purchased for as little as \$200 (this can be recovered from permit fees). It is important to recognize that a local Code Enforcement Officer shall not do elevation certificates for permitting purposes within a Maine community that he or she is responsible for administering the floodplain management ordinance. The community floodplain management ordinances require the elevations for permitting new construction or substantial improvements or other development proposals that require elevations, be done by a Maine Professional Land Surveyor, Professional Engineer or Architect. However, it is important to understand the process that is involved in determining a site elevation.

Starting Elevation

Typically the hardest part of field checking elevations is finding a point of known elevation from which to start. U.S. Geological Survey benchmarks are the best place to start but they can be several miles apart. Older Flood Insurance Studies (FIS) will provide some reference marks (RMs) however; the newer FIS do not provide RMs. Often the local engineer will keep elevation records from sewer or street projects. (Note: Make sure local records or bench marks are based on the same datum as the flood elevation). A community with no known elevations should contact the State Floodplain Management Program, the U.S. Geologic Survey, or the Army Corps of Engineers for Assistance.



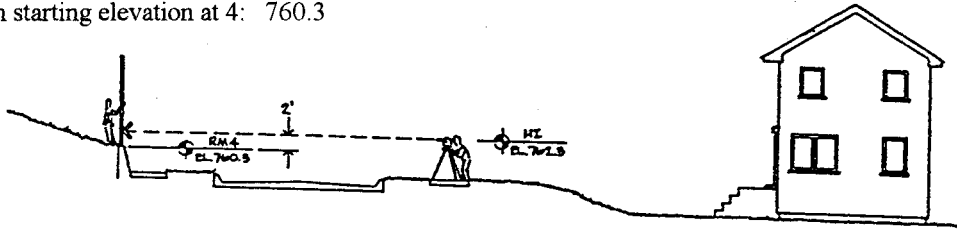
(Photos) A FEMA hydrologist works with the Maine State Planning Office to locate an elevation reference mark (ERM). . Photos by Lou Sidell, Maine Office of Floodplain Management



A two person team is needed. One needs to run the level and the second serves as the rod man. This person places the rod on a point where the elevation is known, such as a reference mark from a Flood Insurance Study (starting elevation). It is important that the person holding the rod hold it straight to get accurate readings. The second levels the instrument and reads the height where the cross hairs show on the rod. This is called the "back sight." Add it to the starting elevation to produce HI (height of instrument).

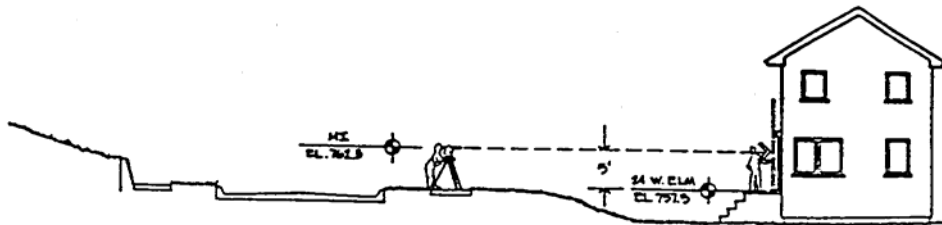
Running the Level

Known starting elevation at 4: 760.3



Starting elevation (760.3) + reading on rod (2') = Height of Instrument (HI)

Next the person with the rod places the rod on the lowest floor. Keeping the instrument level, the building official turns it to the rod and reads the height. This height is called the "fore sight." This number is subtracted from HI and gives the elevation of the lowest floor.



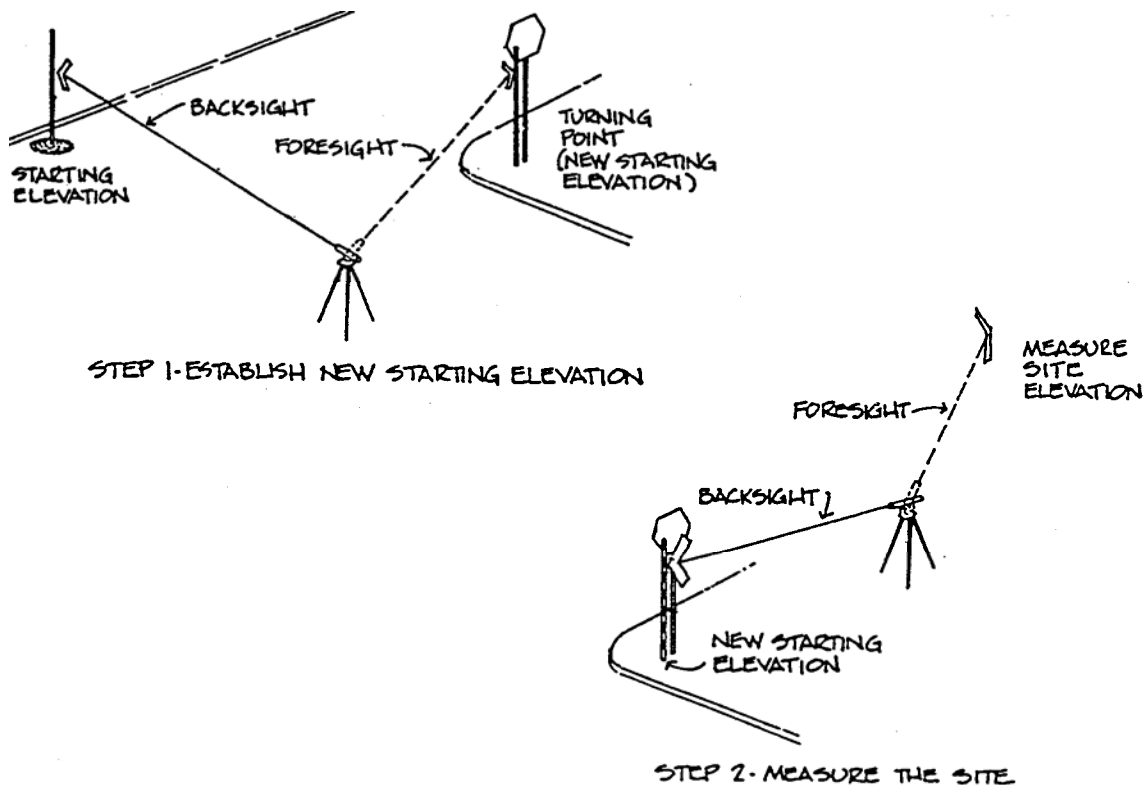
HI (762.3) minus foresite (5') = lowest floor elevation (757)

There is a standard way of recording the figures obtained. This method should be followed to assist engineers or other officials in understanding what was done. It is important that the records kept be as detailed as possible, especially the location of where the rod was placed as this will help later field checks to refer to the elevation records. This record should be kept with the permit records.

PERMIT NO. <u>85-12-03-11</u>		BUILDING OFFICIAL <u>Bill D. Best</u>			
SITE <u>24 West Elm</u>		FLOOD PROTECTION ELEVATION <u>756.0</u>			
Station	back-sight	HI	fore-sight	Elevation	Description
RM 4	2'	762.3		760.3	Flood Insurance Study Reference Mark
24 West Elm			5'	757.3	Top of Floor at Front Door

Running a Turn

When the starting elevation is too far to see from the site you want to measure, a "turn" must be run. This is simply shooting the foresight to a selected "turning point." The level is then moved and a back sight is read with the turning point acting as the new starting elevation.



The CEO may want to help the applicant (and future enforcement work) by running the level before the permit is approved. The flood protection elevation could be marked at the building site. This shows the developer how high the structure must be built and can be helpful if plans must be modified. It will also make checking the "as built" elevation much quicker. A thorough record must be kept describing the mark to ensure that it won't be moved (e.g., "nail with red tape 4 feet from ground in largest oak tree in northeast corner of lot - FPE - 465.2 feet NGVD").

Helpful Hints

From experienced personnel come the following hints on checking elevations in the field:

- A level mounted on a tripod, although more expensive, is more accurate and easier to use.
- Use an "automatic level." It levels itself, saving time, particularly when there are a lot of turning points.
- A light-weight fiberglass rod saves wear and tear on the person holding the rod. The ability to be extended to 25 feet is a feature that is very useful in steep terrain and for long shots.
- A level with high power magnification will help on long shots.
- Because there are never enough benchmarks, make an agreement with the Highway Department to be allowed to establish reference marks on pavement, bridges, etc.
- Maintain a reference file of area benchmarks with information from flood insurance studies, The United States Geological Survey, U.S. Army Corps of Engineers, the state highway department and utility companies.

Appendix D
Elevation Certificate



FEMA

NATIONAL FLOOD INSURANCE PROGRAM

ELEVATION CERTIFICATE

AND

INSTRUCTIONS

NATIONAL FLOOD INSURANCE PROGRAM ELEVATION CERTIFICATE

PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for the Elevation Certificate is estimated to average 3.5 hours per response. Burden means the time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to the Federal Emergency Management Agency (FEMA). You are not required to respond to the collection of information unless a valid OMB control number is displayed in the upper right corner of the form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: U.S. Department of Homeland Security, Federal Emergency Management Agency, Mitigation Division, 500 C Street SW, Washington DC 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.** To obtain or retain benefits under the National Flood Insurance Program (NFIP), you must respond to this collection of information.

PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in the FEMA Floodplain Management Bulletin about using the Elevation Certificate, available on FEMA's website at www.fema.gov/fima/fpmbul.shtm. Click on "FEMA 467-1 Elevation Certificate Cover and Bulletin."

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expires February 28, 2009

Important: Read the instructions on pages 1-8.

SECTION A - PROPERTY INFORMATION		For Insurance Company Use:
A1. Building Owner's Name		Policy Number
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.		Company NAIC Number
City	State	ZIP Code
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)		
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.)		
A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983		
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.		
A7. Building Diagram Number _____		
A8. For a building with a crawl space or enclosure(s), provide:		A9. For a building with an attached garage, provide:
a) Square footage of crawl space or enclosure(s) _____ sq ft		a) Square footage of attached garage _____ sq ft
b) No. of permanent flood openings in the crawl space or enclosure(s) walls within 1.0 foot above adjacent grade _____		b) No. of permanent flood openings in the attached garage walls within 1.0 foot above adjacent grade _____
c) Total net area of flood openings in A8.b _____ sq in		c) Total net area of flood openings in A9.b _____ sq in

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION					
B1. NFIP Community Name & Community Number		B2. County Name		B3. State	
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use base flood depth)
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9. ☐ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other (Describe) _____					
B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other (Describe) _____					
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☐ No Designation Date _____ ☐ CBRS ☐ OPA					

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)	
C1. Building elevations are based on: ☐ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction *A new Elevation Certificate will be required when construction of the building is complete.	
C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7. Benchmark Utilized _____ Vertical Datum _____ Conversion/Comments: _____	
Check the measurement used.	
a) Top of bottom floor (including basement, crawl space, or enclosure floor)	_____ feet ☐ meters (Puerto Rico only)
b) Top of the next higher floor	_____ feet ☐ meters (Puerto Rico only)
c) Bottom of the lowest horizontal structural member (V Zones only)	_____ feet ☐ meters (Puerto Rico only)
d) Attached garage (top of slab)	_____ feet ☐ meters (Puerto Rico only)
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments)	_____ feet ☐ meters (Puerto Rico only)
f) Lowest adjacent (finished) grade (LAG)	_____ feet ☐ meters (Puerto Rico only)
g) Highest adjacent (finished) grade (HAG)	_____ feet ☐ meters (Puerto Rico only)

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION			
This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.			
☐ Check here if comments are provided on back of form.			
Certifier's Name		License Number	
Title		Company Name	
Address	City	State	ZIP Code
Signature	Date	Telephone	

PLACE
SEAL
HERE

IMPORTANT: In these spaces, copy the corresponding information from Section A.			For Insurance Company Use:	
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number	
City	State	ZIP Code	Company NAIC Number	

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments

Signature

Date

☐ Check here if attachments

SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1-E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1-E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawl space, or enclosure) is _____ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawl space, or enclosure) is _____ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6-8 with permanent flood openings provided in Section A Items 8 and/or 9 (see page 8 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ feet ☐ meters ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is _____ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is _____ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge.*

Property Owner's or Owner's Authorized Representative's Name

Address

City

State

ZIP Code

Signature

Date

Telephone

Comments

☐ Check here if attachments

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8. and G9.

- G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. ☐ The following information (Items G4.-G9.) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
-------------------	------------------------	---

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: _____ feet ☐ meters (PR) Datum _____

G9. BFE or (in Zone AO) depth of flooding at the building site: _____ feet ☐ meters (PR) Datum _____

Local Official's Name

Title

Community Name

Telephone

Signature

Date

Comments

☐ Check here if attachments

Building Photographs

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use:
			Policy Number
City	State	ZIP Code	Company NAIC Number
If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.			

Building Photographs

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use: Policy Number
City	State	ZIP Code	Company NAIC Number
If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."			

INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

SECTION A – PROPERTY INFORMATION

Items A1.-A4. This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

Item A5. Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

Item A6. If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

Item A7. Select the diagram on pages 7-8 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

Item A8.a Provide the square footage of the crawl space or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawl space or enclosure(s). Examples of elevated buildings constructed with crawl space and enclosure(s) are shown in Diagrams 6-8 on page 8. Diagram 2 or 4 should be used for a building constructed with a crawl space floor that is below the exterior grade on all sides.

Items A8.b-c Enter in Item A8.b the number of permanent flood openings in the crawl space or enclosure(s) walls that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net

area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. If the crawl space or enclosure(s) walls have no permanent openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A8.b-c.

Item A9.a Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

Items A9.b-c Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the adjacent grade. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter "0" (zero) in Items A9.b-c.

SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building's location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community's FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

Item B1. NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's web site at <http://www.fema.gov/fema/csb.shtm>, or call 1-800-358-9616.

Item B2. County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter "unincorporated area." For an independent city, enter "independent city."

Item B3. State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

Items B4.-B5. Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a four-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

Item B6. FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

Item B7. FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

Item B8. Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

Item B9. Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community's floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Item B10. Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

Item B11. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Item B12. Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. An information sheet explaining CBRS areas and OPAs may be obtained on FEMA's web site at http://www.fema.gov/fhm/fmc_cbars.shtml.

SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

Complete Section C if the building is located in any of Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawl spaces to shoot the elevation of the crawl space floor. If access to the crawl space is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawl space to the "next higher floor," and then subtract the crawl space height from the elevation of the "next higher floor." If there is no access to the crawl space, use the exterior grade next to the structure to measure the height of the crawl space to the "next higher floor."
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawl space floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawl space floor to the next higher floor, try to verify this by looking inside the crawl space through any openings or vents.

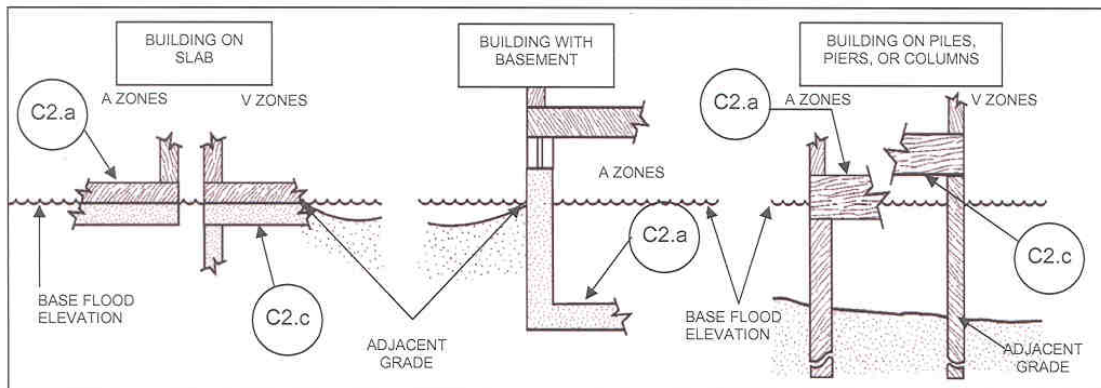
In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

Item C1. Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-g. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select "Finished Construction" only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

Item C2. A field survey is required for Items C2.a-g. Provide the benchmark utilized, the vertical datum for that benchmark, and any datum conversion necessary. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other

unique identifier assigned by the maintainer of the benchmark. Also provide the vertical datum for the benchmark elevation. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. All elevations for the certificate, including the elevations for Items C2.a-g, must be referenced to the datum on which the BFE is based. Show the datum conversion, if applicable, in this section or in the Comments area of Section D. For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

Items C2.a-d Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7.) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-g. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawl space, Diagram 8, enter the elevation of the top of the crawl space floor in Item C2.a, whether or not the crawl space has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*



Item C2.e Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

Items C2.f-g Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. If the certificate is to be used to support a request for a LOMA or LOMR-F, provide in the Comments area the lowest adjacent grade elevation measured at the deck support or stairs if that elevation is lower than the building's lowest adjacent grade. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable

by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, or other relevant information not specified on the front.

**SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO
& ZONE A (WITHOUT BFE)**

Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1.- E4. is based on the "natural grade."

Items E1.a and b Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community's floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

Item E2. For Building Diagrams 6-8 with permanent flood openings (see page 8), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

Item E3. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E4. Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter "N/A" for not applicable.*

Item E5. For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community's floodplain management ordinance.

SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner's representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner's representative who provided the information on the certificate.

SECTION G - COMMUNITY INFORMATION (OPTIONAL)

Complete as indicated. The community official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1.** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2.** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3**, if the information in Items G4.-G9. has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4.-G9. provide a way to document these determinations.

Item G4. Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

Item G5. Date Permit Issued. Enter the date the permit was issued for the building.

Item G6. Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

Item G7. New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

Item G8. As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

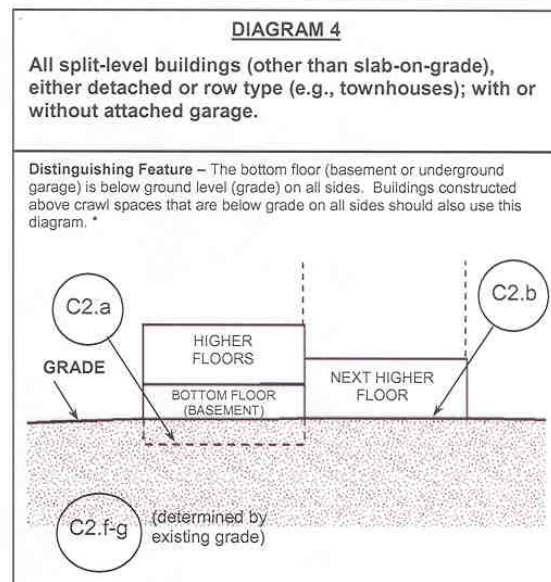
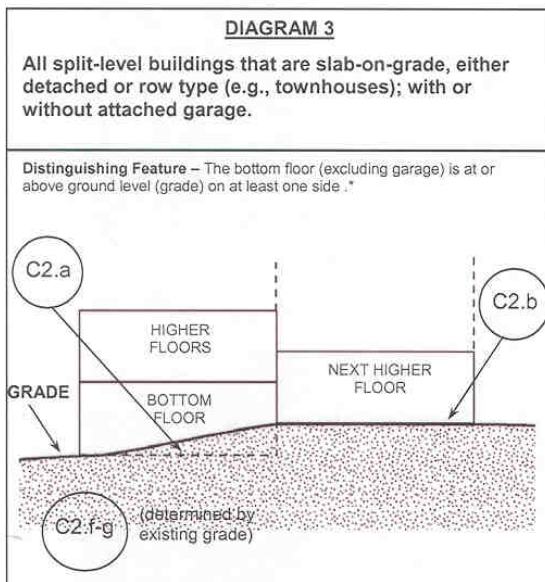
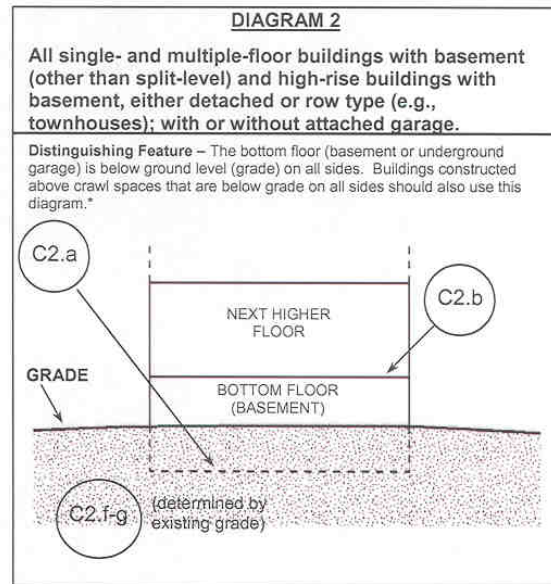
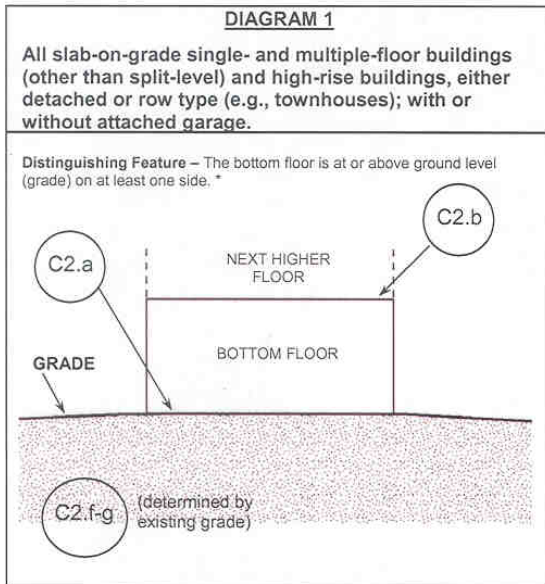
Item G9. BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

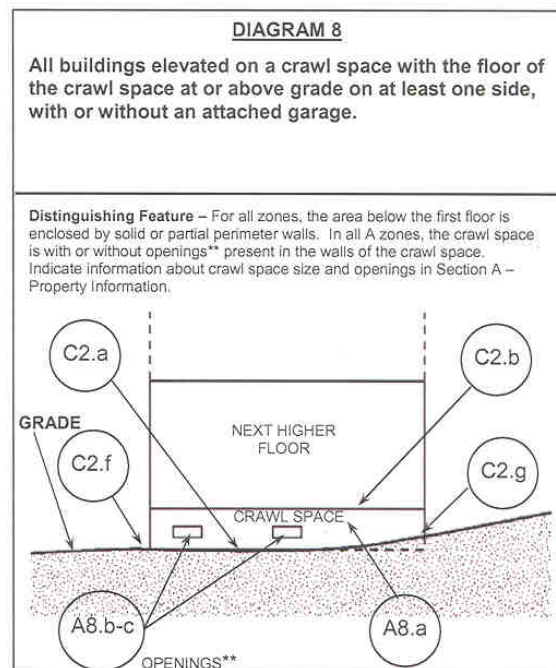
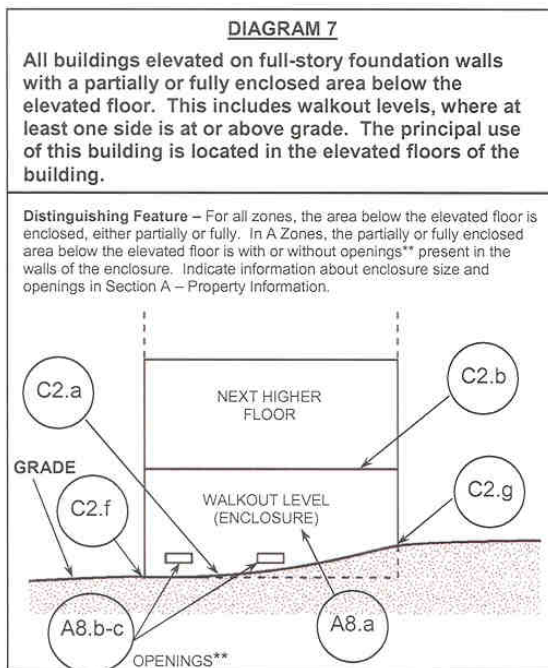
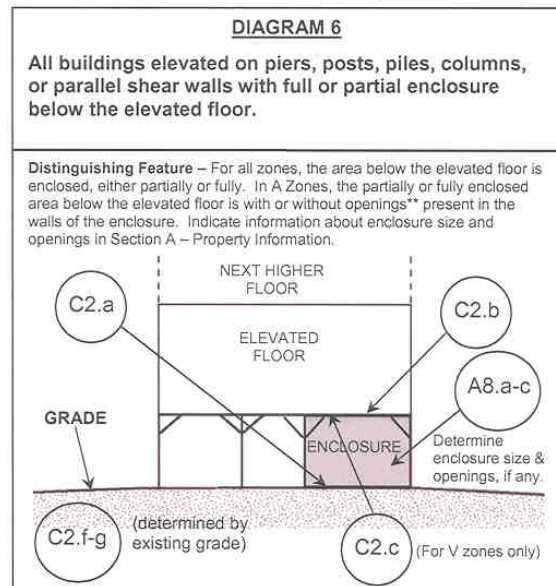
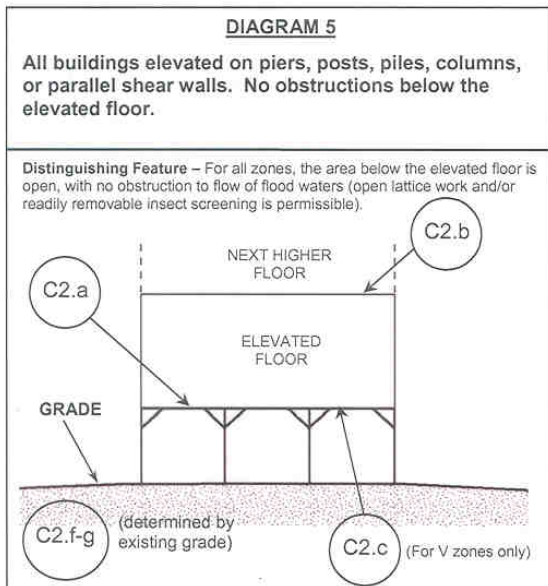
BUILDING DIAGRAMS

The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7., the square footage of crawl space or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-g.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).



* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.



** An "opening" is defined as a permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawl spaces with a total net area of not less than one square inch for every square foot of area enclosed. Each opening must be on different sides of the enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter. The bottom of the openings must be no higher than one foot above the grade underneath the flood vents. Alternatively, you may submit a certification by a registered professional engineer or architect that the design will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening.

DRY FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 3.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20742, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

General: This information is provided pursuant to Public Law 96-511 (the Paperwork Reduction Act of 1980, as amended), dated December 11, 1980, to allow the public to participate more fully and meaningfully in the Federal paperwork review process.

Authority: Public Law 96-511, amended; 44 U.S.C. 3507; and 5 CFR 1320.

PRIVACY ACT STATEMENT

Authority: Title 44 CFR § 60.3, 61.7 and 61.8.

Principal Purpose(s): This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

Routine Use(s): The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 79 Fed. Reg. 28747 (May 19, 2014), and upon written request, written consent, by agreement, or as required by law.

Disclosure: The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or being subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

PURPOSE OF THE DRY FLOODPROOFING CERTIFICATE FOR NON-RESIDENTIAL STRUCTURES

Under the National Flood Insurance Program (NFIP), the dry floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation (BFE) or for certain flood zones, the natural Highest Adjacent Grade (HAG). A dry floodproofing design certification is required for non-residential structures that are dry floodproofed and the dry floodproofed non-residential portions of mixed-use buildings. This form is to be used for that certification. FEMA Form 206-FY-21-122 NFIP Residential Basement Floodproofing Certificate is required for the residential portions of mixed-use buildings.

A dry floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. Before a dry floodproofed building is designed, numerous planning considerations, including flood warning time, uses of the building, mode of entry to and exit from the building and the site in general, floodwater velocities, flood depths, debris impact potential, flood frequency, and any other State and local requirements must be addressed to ensure that dry floodproofing will be a viable floodplain management measure.

The minimum NFIP requirement is to dry floodproof a building to the BFE. However, to be in compliance with the requirements of American Society of Civil Engineers (ASCE) 24, *Flood Resistant Design and Construction*, one foot is subtracted from the dry floodproofed elevation. Therefore, a building must be dry floodproofed to one foot above the BFE to be considered for floodproofing credit. For B, C, D, or X flood zones, the building's dry floodproofed design elevation must be at least two feet above the natural HAG to be considered for floodproofing credit.

Additional guidance can be found in FEMA Publication 936, *Floodproofing Non-Residential Buildings* (2013), and NFIP Technical Bulletin 3, *Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings* (2021), available on FEMA's Building Science Resource Library website at www.fema.gov/ar/emergency-managers/risk-management/building-science/publications.

Copy all pages of this Dry Floodproofing Certificate and all attachments for 1) community official, 2) insurance agent/company, and 3) building owner. The dry floodproofing of non-residential buildings and the non-residential portions of mixed-use buildings may be permitted as an alternative to elevating to or above the Base Flood Elevation (BFE); however, a dry floodproofing design certification is required. This form is to be used for that certification. Dry floodproofing of a residential building does not alter a community's floodplain management elevation requirements or affect the insurance rating unless the community has been issued an exception by FEMA to allow dry floodproofed residential basements. The permitting of a dry floodproofed residential basement requires a separate certification specifying that the design complies with the local floodplain management ordinance.

PROPERTY INFORMATION

Building Owner's Name: _____

Building Street Address (Including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____

City: _____ State: ☐ ☒ ZIP Code: _____

Property Description (e.g., Lot and Block Numbers, or Legal Description) and/or Tax Parcel Number: _____

Building Use (e.g., Non-Residential, Mixed Use, Addition, Accessory, etc.): _____

Latitude/Longitude: Lat. _____ Long. _____

Horizontal Datum: ☐ NAD 1927 ☐ NAD 1983 ☐ WGS 84

FOR INSURANCE COMPANY USE

Policy Number: _____

Company NAIC Number: _____

SECTION I – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

NFIP Community Name: _____ NFIP Community Identification Number: _____

County Name: _____ State: ☐ ☒ Map/Panel Number: _____ Suffix: _____

FIRM Index Date: _____ FIRM Panel Effective/Revised Date: _____ Flood Zone(s): _____

BFE(s) (Zone AO, use Base Flood Depth (BFD)): _____

Indicate the source of the BFE data or BFD entered above: ☐ Flood Insurance Study (FIS) ☐ FIRM

☐ Community Determined ☐ Other: _____

Indicate elevation datum used for BFE shown above: ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____

Is a Limit of Moderate Wave Action (LiMWA) shown on the FIRM? ☐ Yes ☐ No

If Yes, is the property located in the Coastal A Zone [area between the LiMWA and Zone V boundary (or shoreline)]? ☐ Yes ☐ No

Is the property located in a floodway? ☐ Yes ☐ No If Yes, provide the velocity at the building location: _____

Is the property located in an alluvial fan? ☐ Yes ☐ No

If Yes, provide the depth at the building location: _____ and velocity: _____

SECTION II – DRY FLOODPROOFED DESIGN CERTIFICATION

(By a Registered Professional Engineer or Architect licensed in the State where the building is located)

(Note: For insurance rating purposes in all zones except for B, C, D, or X, the building's dry floodproofed design elevation must be at least one foot above the BFE to be considered for floodproofing credit. For B, C, D, or X Zones, the building's dry floodproofed design elevation must be at least two feet above the natural HAG to be considered for floodproofing credit. If the building is not dry floodproofed to the above-mentioned standards, then the building will be ineligible for floodproofing credit. See the Instructions section for information on documentation that must accompany this certificate if being submitted for flood insurance rating purposes.)

Briefly list measures incorporated into the design to meet the performance criteria for dry floodproofing and attach calculations showing the structure is designed with structural components that have the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy and will be watertight and substantially impermeable to the passage of water.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____ City: _____ State: ☐ ☒ ZIP Code: _____	FOR INSURANCE COMPANY USE Policy Number: _____ Company NAIC Number: _____
SECTION II – DRY FLOODPROOFED DESIGN CERTIFICATION (Continued) (By a Registered Professional Engineer or Architect licensed in the State where the building is located)	
Provide elevations used in design, specifications and construction drawings. In Puerto Rico only, enter meters. Indicate elevation datum used for the elevations in this section. ☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: _____ Elevation datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No If Yes, describe the source of the conversion factor in the Comments area of this Section. A. Dry Floodproofed Design Elevation: _____ ☐ feet ☐ meters B. Lowest Adjacent Grade (LAG) next to the building: ☐ Natural ☐ Finished _____ ☐ feet ☐ meters C. Highest Adjacent Grade (HAG) next to the building: ☐ Natural ☐ Finished _____ ☐ feet ☐ meters	
Non-Residential Dry Floodproofed Design Certification: <i>I certify the structure, based upon development and/or review of the design and specifications for construction, has been designed in accordance with the accepted standards of practice (ASCE 24-05, ASCE 24-14 or their equivalent) and the following provisions.</i> <i>The structure, together with attendant utilities and sanitary facilities will be watertight to the dry floodproofed design elevation indicated above, will be substantially impermeable to the passage of water, and shall perform in accordance with the 44 Code of Federal Regulations (44 CFR 60.3(c)(3)).</i> <i>All structural components are capable of resisting hydrostatic and hydrodynamic flood forces, including the effects of buoyancy, and anticipated debris impact forces up to the dry floodproofed design elevation. Flood damage-resistant materials are used for all areas where seepage is intended to collect inside the dry floodproofed areas up to at least 4 inches above the floor.</i> <i>I certify that the information in Section II on this certificate represents a true and accurate determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.</i> Certifier's Name: _____ License Number (or Affix Seal): _____ Title: _____ Company Name: _____ Mailing Address: _____ City: _____ State: ☐ ☒ ZIP Code: _____ Phone #1: _____ Ext.: _____ Phone #2: _____ Ext.: _____ Email: _____ Signature: _____ Date: _____ Place Seal Here	
Comments (including source of conversion factor and description of any attachments):	

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____ City: _____ State: _____ ☐ ZIP Code: _____	FOR INSURANCE COMPANY USE Policy Number: _____ Company NAIC Number: _____
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SECTION III – DRY FLOODPROOFED ELEVATION CERTIFICATION

(By a Registered Professional Land Surveyor, Engineer or Architect licensed in the State where the building is located)

Benchmark Utilized: _____ Vertical Datum: _____

Indicate elevation datum used for the elevations provided in this section:

☐ NGVD 1929
 ☐ NAVD 1988
 ☐ Other/Source: _____

Elevation datum used for building elevations must be the same as that used for the BFE. Conversion factor used? ☐ Yes ☐ No

If Yes, describe the source of the conversion factor in the Comments area of this section.

A. Dry floodproofed elevation (must be based on finished construction): _____ ☐ feet ☐ meters

B. Lowest Adjacent Grade (LAG) next to the building: ☐ Natural ☐ Finished _____ ☐ feet ☐ meters

C. Natural Highest Adjacent Grade (HAG) next to the building: _____ ☐ feet ☐ meters

Height of floodproofing on the building above the natural or finished LAG is _____ feet.
 (In Puerto Rico only: _____ meters.)

(Note: For insurance rating purposes in all eligible zones inside the SFHA, the building's dry floodproofed design elevation must be at least one foot above the BFE to be considered for floodproofing credit. For B, C, D, or X Zones, the building's dry floodproofed design elevation must be at least two feet above the natural HAG. If the building is not dry floodproofed to the above-mentioned standards, then the building will not be considered for floodproofing credit. See the Instructions section for information on documentation that must accompany this certificate if being submitted for flood insurance rating purposes.)

Non-Residential Dry Floodproofed Elevation Information Certification:

Section III certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information.

I certify that the information in Section III on this Certificate represents a true and accurate interpretation and determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Certifier's Name: _____ License Number (or Affix Seal): _____
 Title: _____ Company Name: _____
 Mailing Address: _____
 City: _____ State: _____ ☐ ZIP Code: _____
 Phone #1: _____ Ext.: _____ Phone #2: _____ Ext.: _____
 Email: _____

Place Seal Here

Signature: _____ Date: _____

Comments (including source of conversion factor and description of any attachments):

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.: _____ City: _____ State: ☐ ZIP Code: _____	FOR INSURANCE COMPANY USE Policy Number: _____ Company NAIC Number: _____
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SECTION IV – DRY FLOODPROOFED CONSTRUCTION CERTIFICATION
(By a Registered Professional Engineer or Architect licensed in the State where the building is located)

Non-Residential Dry Floodproofed Construction Certification:

I certify the structure, based upon development and/or review of the design, specifications, as-built drawings for construction and physical inspection, has been designed and constructed in accordance with the accepted standards of practice (ASCE 24-05, ASCE 24-14 or their equivalent) and any alterations also meet those standards and the following provisions.

- *The structure, together with attendant utilities and sanitary facilities is watertight to the dry floodproofed design elevation indicated above, is substantially impermeable to the passage of water, and shall perform in accordance with the 44 Code of Federal Regulations (44 CFR 60.3(c)(3)).*
- *All structural components are capable of resisting hydrostatic and hydrodynamic flood forces, including the effects of buoyancy, and anticipated debris impact forces up to the dry floodproofed design elevation.*
- *The floodproofed elevation is in accordance with the design and any alteration(s) to the design.*
- *Flood damage-resistant materials have been incorporated/used in all areas where seepage would collect inside the dry floodproofed areas up to at least 4 inches above the floor.*

I certify that the information in Section IV on this certificate represents a true and accurate determination by the undersigned using the available information and data. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Certifier's Name: _____ License Number (or Affix Seal): _____
 Title: _____ Company Name: _____
 Mailing Address: _____
 City: _____ State: ☐ ZIP Code: _____
 Phone #1: _____ Ext.: _____ Phone #2: _____ Ext.: _____
 Email: _____

Place Seal Here

Signature: _____ Date: _____

**Copy all pages of this Dry Floodproofing Certificate and all attachments for:
 1) community official, 2) insurance agent/company, and 3) building owner.**

REQUIRED DOCUMENTATION

In order to ensure compliance and provide reasonable assurance that due diligence had been applied in designing and constructing dry floodproofing measures, the following information must be provided with the completed Dry Floodproofing Certificate:

- 1. Photographs.** All photographs must be clear and in color, identified and include the date taken. Where the building is in the course of construction, provide clear descriptions of any other dry floodproofed components and attachments to be incorporated.
 - a. Photographs of all sides and aspects of the floodproofed building.
 - b. Photographs of all components used to provide dry floodproofing protections (shields, gates, barriers, sump pumps, backflow (non-return) valves or shutoff valves, etc.).
 - c. Photographs of the installed barriers/shields and corresponding clear photographs of openings areas where barriers and shields are deployed without the barriers/shields installed (doors, windows, ventilation intakes, etc.).
 - d. Photographs of penetrations through dry floodproofed envelopes (utilities, mechanical).
 - e. Photographs of backup power source for sump pumps.
- 2. Comprehensive Flood Emergency Operations Plan** for the entire structure to include but not limited to:
 - a. The personnel, equipment, tools, and supplies needed to deploy all dry floodproofing system components with sufficient time prior to the onset of flooding or conditions such as high winds that could interfere with efficient deployment of measures.
 - b. Clearly defined chain of command and assigned responsibilities for personnel involved in the installation of dry floodproofing measures.
 - c. Procedure for notifying personnel responsible for installing dry floodproofing measures, along with a list of duty requirements.
 - d. Decision tree that identifies the sequence, timeline, and responsible parties for installing the dry floodproofing components, including the triggers or benchmarks that will initiate procedures.
 - e. Written description and map of the storage locations and types of dry floodproofing measures to be installed or deployed (shields, gates, barriers, and components as well as all associated hardware), along with any equipment, tools, and materials required for installation.
 - f. Conditions that require the deployment of active dry floodproofing measures (e.g., installation of flood shields, closing of flood doors, closing of manual valves, staging of pumps).
 - g. Instructions for installing or deploying each dry floodproofing measure and the order of installation if important for effectiveness.
 - h. Instructions for connecting standby (emergency) power source (e.g., generator) for critical equipment such as sump pumps and egress lighting
 - i. Contact information for the manufacturer and designer to expedite obtaining replacement parts and support as needed
 - j. Evacuation plans for all personnel
 - k. Requirements for installation and deployment drills and training program (at least once a year)
 - l. Requirement for regular review and update of the plan procedures
- 3. Comprehensive Inspection and Maintenance Plan** for the entire structure to include but not limited to:
 - a. Exterior envelope of the structure, such as wall and foundation systems, to identify possible structural and waterproofing deficiencies such as cracks, water staining, and penetrations.
 - b. All penetrations to the exterior of the structure.
 - c. Slabs and wall/slab joints, including structural and drainage deficiencies.
 - d. Flood shields, gates, panels, doors, glazing, barriers, and other components designed to provide dry floodproofing protection, including all seals, gaskets, fasteners, and mounting hardware and tools.
 - e. Sump pumps (or self-priming pumps) and interior drain system.
 - f. Emergency power systems.
 - g. Testing of emergency generators, sump pumps, and other drainage measures.
 - h. Backflow (non-return) valves or shutoff valves.
 - i. Location of all flood shields, gates, panels, and other components including all hardware along with any materials or tools needed to seal the dry floodproofed area.
 - j. Contact information for the manufacturer of the shields and other components to determine the availability of replacement gaskets, seals, and other parts and to ask questions.
 - k. Cadence of inspection and maintenance plan.
- 4. Building owner** acknowledgment that verifies that the owner is aware of the criteria for when the dry floodproofing measures must be installed and that they know how to install all the measures. This would be signed by the owner. Additionally, if the measures are to be installed by a third-party, then the third-party contractor must sign that they know how to install the measures.

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

**INSTRUCTIONS FOR COMPLETING THE DRY FLOODPROOFING CERTIFICATE
FOR NON-RESIDENTIAL STRUCTURES**

To receive credit for dry floodproofing, a completed Dry Floodproofing Certificate for Non-Residential Structures is required for non-residential buildings and the non-residential portions of mixed-use buildings in the Regular Program communities, located in all flood zones, including Zone X. For certification of finished construction, this form is invalid without Sections I through IV.

PROPERTY INFORMATION

This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and/or property description. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed or attach additional comments.

Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.504322°, -110.758522°) or degrees, minutes, seconds (e.g., 39° 30' 15.52", -110° 45' 30.72") format. If decimal degrees are used, provide coordinates to at least 6 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 2 decimal places or better. Provide the datum of the latitude and longitude coordinates (FEMA prefers the use of NAD 1983). Indicate the method or source used to determine the latitude and longitude in the Comments area.

SECTION I – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

Complete the Dry Floodproofing Certificate using the Flood Insurance Study (FIS) and FIRM in effect at the time of the certification.

The information for Section I is obtained by reviewing the FIS and the FIRM panel that includes the building's location. Information about the current FIS and FIRM is available from FEMA by visiting msc.fema.gov or contacting the local floodplain administrator. If a Letter of Map Amendment (LOMA), Letter of Map Revision (LOMR), or LOMR Based on Fill (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area, as appropriate.

For a building in an area that was mapped in one community but is now in another community due to annexation or dissolution, enter the community name and 6-digit number of the community in which the building is now located in the name of the county or new county, if necessary; and the FIRM index date for the community the building is now located in. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction. If the map in effect at the time of the building's construction was other than the current FIRM, and you have the past map information pertaining to the building, provide the information in the Comments area.

Note: Indicate in the Comments Section, if using information based on best available data, such as base-level engineering or advisory flood hazard data (contact the local floodplain administrator to confirm).

NFIP Community Name & Community Identification Number. Enter the complete name of the community in which the building is located, and the associated 6-digit Community Identification Number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a "community" is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA's web site at www.fema.gov/national-flood-insurance-program-community-status-book.

County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter the county name and "unincorporated area." For an independent city, enter "independent city."

State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

Map/Panel Number and Suffix. Enter the 10-character "Map Number" or "Community Panel Number" shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the "Map Number" is the letter "C" followed by a 4-digit map number. For maps not in a county-wide format, enter the "Community Panel Number" shown on the FIRM.

FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

FIRM Panel Effective/Revised Date. Enter the effective date shown on the current FIRM panel. The current FIRM panel effective date can be determined by visiting msc.fema.gov or contacting the local floodplain administrator. In addition, if the area where the building is located was revised by a LOMR, include the LOMR effective date.

Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter "A" or "V" are considered Special Flood Hazard Areas. The flood zones are A, AE, A1–A30, V, VE, V1–V30, AH, AO, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

BFE(s). Using the appropriate Flood Insurance Study (FIS) Profile, FIS Data Table (e.g., Transect, Floodway, etc.), or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico). If the building is located in more than one flood zone, list all appropriate BFEs.

BFEs are shown in the FIS or on a FIRM for Zones A1–A30, AE, AH, V1–V30, VE, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1–A30, AR/AH, or AR/AO.

In unnumbered A or V zones where BFEs are not provided in the FIS or on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources (e.g., Base Level Engineering) for the building site. For subdivisions and other developments of more than 50 lots or 5 acres in Zone A, establishment of BFEs is required per Floodplain Management requirements 44 CFR 60.3(b)(3). If a BFE is obtained from another source, enter the BFE. The BFE entered must be based on hydrologic and hydraulic analyses. In an unnumbered A Zone where BFEs are not obtained from another source, enter N/A.

For areas in which BFEs have not been established, designers can refer to FEMA 265 *Zone A Manual: Managing Floodplain Development in Approximate Zone A Areas* (FEMA 1995), https://www.fema.gov/sites/default/files/documents/fema_approx-zone-a-guide.pdf?id=2215. This guide provides information on obtaining and developing BFEs.

Source of BFE. Indicate the source of the BFE or flood depth that you entered. If the BFE is from a source other than FIS Profile, FIRM, or community, include the name of the study, the agency or company that produced it, and the date when the study was completed. Visit msc.fema.gov or contact the local floodplain administrator to access the current FIS and FIRM.

Elevation Datum. Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

Limit of Moderate Wave Action (LiMWA). Indicate if a LiMWA is shown on the FIRM and the location of the building in relation to the LiMWA.

Floodway. Indicate if building is in a floodway and if applicable, the velocity in the area of the building. See FEMA P-936, *Floodproofing Nonresidential Buildings* for more information on determining the velocity.

Alluvial Fan. Indicate if building is in an alluvial fan and if applicable, the depth and velocity in the area of the building.

SECTION II – DRY FLOODPROOFED DESIGN CERTIFICATION

Section II is to be completed by a Registered Professional Engineer or Architect licensed in the State where the building is located to certify the design of the dry floodproofing measures as required by 44 CFR 60.3(c)(4).

SECTION III – DRY FLOODPROOFED ELEVATION CERTIFICATION

Section III is to be completed by a Registered Professional Land Surveyor, Engineer, or Architect licensed in the State where the building is located to provide the surveyed elevations of the as-built construction. To ensure that all required elevations are obtained, it will be necessary to physically enter the building.

SECTION IV – DRY FLOODPROOFED CONSTRUCTION CERTIFICATION

Section IV is to be completed by a Registered Professional Engineer or Architect licensed in the state where the building is located to certify the structure, based upon development and/or review of the design, specifications, as-built drawings for construction and physical inspection, has been designed and constructed in accordance with the accepted standards of practice (ASCE 24-05, ASCE 24-14 or their equivalent) and any alterations also meet those standards and the provisions listed in Section IV.

National Flood Insurance Program

V-ZONE CERTIFICATE

Name _____ Policy Number (*Insurance Co. Use*) _____
Building Address or
Other Description _____
City _____ State _____ Zip Code _____

SECTION I: Flood Insurance Rate Map (FIRM) Information

Community Number _____ Panel Number _____ Suffix _____ Date of FIRM Index _____ FIRM Zone _____

SECTION II: Elevation Information

NOTE: This Certificate does not substitute for an Elevation Certificate

1. Elevation of the Bottom of Lowest Horizontal Structural Member feet ☐ NGVD or ☐ NAVD
2. Base Flood Elevation (BFE) feet ☐ NGVD or ☐ NAVD
3. Elevation of Lowest Adjacent Grade feet ☐ NGVD or ☐ NAVD
4. Approximate Depth of Anticipated Scour/Erosion used for Foundation Design feet ☐ NGVD or ☐ NAVD
5. Embedment Depth of Pilings or Foundation Below Lowest Adjacent Grade feet ☐ NGVD or ☐ NAVD

SECTION III: V-Zone Certification Statement

NOTE: This section must be certified by a registered engineer or architect

I certify that I have developed or reviewed the structural design, plans, and specifications for construction and that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the following provisions:

- The bottom of the lowest horizontal structural member of the lowest floor (excluding piles and columns) is elevated to or above the BFE; and
- The pile and column foundation and structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of the wind and water loads acting simultaneously on all building components. Water loading values used are those associated with the base flood. Wind loading values used are those required by the applicable State or local building code. The potential for scour and erosion at the foundation has been anticipated for conditions associated with the base flood, including wave action.

SECTION IV: Breakaway Wall Certification Statement

NOTE: This section must be certified by a registered engineer or architect
when breakaway walls exceed a design safe loading resistance of 20 pounds per square foot

I certify that I have developed or reviewed the structural design, plans, and specifications for construction and that the design and methods of construction to be used for the breakaway walls are in accordance with accepted standards of practice for meeting the following provisions:

- Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and
- The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (wind and water loading values to be used are defined in Section III).

SECTION V: Certification

Signature below certifies: _____ Section III; _____ Section IV

Certifier's Name _____
Title _____ License Number _____
Street Address _____
City _____ State _____ Zip Code _____
Signature _____ Date _____ Telephone Number _____

National Flood Insurance Program

Hydraulic Openings Certificate

Project Name

I, _____, do hereby certify that the opening(s) designed for installation in the aforementioned building have been engineered to allow for the automatic equalizing of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater during floods up to and including the base (100-year) flood.

[Guidance on engineered openings is available in FEMA's Technical Bulletin-1, *Openings in Foundation Walls*. (August 2008)]

Certifier's Name

Title

Type of License

License Number

Company Name

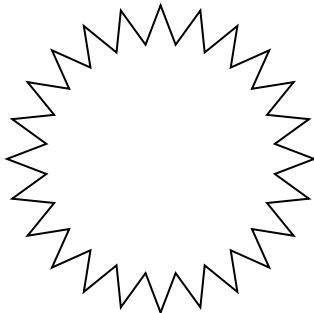
Street Address

City, State, Zip

Telephone Number

Signature

Date



PROFESSIONAL SEAL

Related Publications and Videos

MAINE FLOODPLAIN MANAGEMENT PROGRAM AVAILABLE PUBLICATIONS

- ❑ *Above the Flood: Elevating Your Floodprone House* FEMA 347 Dated: 5/00
- ❑ *Addressing Your Community's Flood Problems-A Guide for Local Officials* ASFPM & Fed. Interagency FPM Task Force
- ❑ *Adoption of Flood Insurance Rate Maps* FEMA-495 Dated: 05
- ❑ *Against the Wind* FEMA-247 Dated: 12/93
- ❑ *A Guide to Hurricane Preparedness Planning for State and Local Officials* CPG2-16 Dated: 12/84
- ❑ *A Unified National Program for Floodplain Management* (Federal Interagency FPM Task Force) Dated: 1994
- ❑ *Answers to Questions About Substantially Damaged Buildings* FEMA-213 Dated: 5/91
- ❑ *Answers to Questions About the National Flood Insurance Program* MitDiv-2 Dated: 5/04 (FEMA)
- ❑ *Appeals, Revisions and Amendments to FIRMs: A Guide for Community Officials* FIA-12 Dated: 1/90
- ❑ *Coastal Construction Manual* FEMA-55 Dated: 6/00 Vol. I, II & III
- ❑ *Community Based Hazard Mitigation Planning* Dated: 8/27/98
- ❑ *Community Rating System Brochure* (FEMA)
- ❑ *Design Guidelines for Flood Damage Reduction* FEMA-15 Dated: 12/81
- ❑ *Design Manual for Retrofitting Flood-prone Residential Structures* FEMA 114 Dated: 7/86
- ❑ *Elevated Residential Structures* FEMA-54 Dated: 3/84
- ❑ *Engineering Principles and Practices for Retrofitting Floodprone Residential Buildings* FEMA-259 Dated: 1/95
- ❑ *Federal Regulations and Instructions on Flood Insurance Compliance for Lenders and Servicers* FIA-16 Dated: 10/93
- ❑ *Flash Flood and Floods...The Awesome Power* ARC-4493 Dated: 7/92
- ❑ *Flood Emergency and Residential Repair Handbook* FIA-13 Dated: 3/86
- ❑ *Floodplain Management Bulletin 1-98 – Use of Flood Insurance Study Data as Available Data* (FEMA)
- ❑ *Floodproofing Non-residential Structures* FEMA-102 Dated: 5/86
- ❑ *Flood Proofing - Techniques, Programs and References* Dated: 2/91 (USACE)
- ❑ *Guidance on Estimating Substantial Damage* FEMA-311 Dated: 10/97
- ❑ *Guidelines and Specifications for Study Contractors* FEMA-37 Dated: 1/95
- ❑ *Guide to Flood Maps: How to Use a Flood Map to Protect Your Property* FEMA-258 Dated: 12/94
- ❑ *Homeowners Guide to Retrofitting* FEMA-312 Dated: 6/98
- ❑ *Hurricanes...The Greatest Storm on Earth* ARC-5030 Dated: 3/94
- ❑ *Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning* FEMA 386 Dated: 5/05
- ❑ *Increased Cost of Compliance Coverage-Interim Guidance for State and Local Officials* FEMA-301 Dated: 9/97
- ❑ *Joining the National Flood Insurance Program* FEMA-496 Dated: 2005
- ❑ *Maine Floodplain Management Handbook* (State Planning Office) Dated: 5/00
- ❑ *Maine Flood Hazard Development Application and Permit Forms* (SPO) Dated: 4/00
- ❑ *Managing Floodplain Development in Approximate Zone A Areas* FEMA-265 Dated: 4/95
- ❑ *Mandatory Purchase of Flood Insurance Guidelines* FEMA-186 Dated: 9/99
- ❑ *Manufactured Home Installation in Flood Hazard Areas* FEMA-85 Dated: 9/85
- ❑ *Mitigation of Flood and Erosion Damage to Residential Buildings in Coastal Areas* FEMA-257 Dated: 10/94

- ❑ *National Flood Insurance Program and Related Regulations* (FEMA)
- ❑ *Preparing Your Home for a Hurricane* ARC-5040 Dated: 1/95
- ❑ *Property Acquisition Handbook for Local Communities* FEMA-317 Dated: 10/98
- ❑ *Protecting Building Utilities From Flood Damage* FEMA-348 Dated: 11/99
- ❑ *Protecting Floodplain Resources: A Guidebook for Communities* FEMA-268 Dated: 9/95
- ❑ *Protecting Your Home From Flood Damage - Mitigation Ideas for Reducing Flood Losses* (FEMA) Dated: 1996
- ❑ *Raising and Moving the Slab-On-Grade House* Dated: 1990 (USACE)
- ❑ *Reducing Damage from Localized Flooding: A Guide for Communities* FEMA-511 Dated: 6/05
- ❑ *Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials* FEMA-116 Dated: 2/87
- ❑ *Repairing Your Flooded Home* FEMA-234 Dated: 8/92
- ❑ *Saving Lives With an All Hazard Warning Network* USDA/FEMA/USDaC
- ❑ *State of Maine Public Officials Handbook on Disaster Assistance* Dated: 9/88 (MEMA)
- ❑ *Technical Bulletin Guide-96* FEMA Dated: 8/96 (FEMA)
- ❑ *Technical Bulletin 1-93 - Openings in Foundation Walls* (FEMA)
- ❑ *Technical Bulletin 2-93 - Flood-Resistant Materials Requirements* (FEMA)
- ❑ *Technical Bulletin 3-93 - Non-Residential Floodproofing - Requirements and Certification* (FEMA)
- ❑ *Technical Bulletin 4-93 - Elevator Installation* (FEMA)
- ❑ *Technical Bulletin 5-93 - Free-of-Obstruction Requirements* (FEMA)
- ❑ *Technical Bulletin 6-93 - Below-Grade Parking Requirements* (FEMA)
- ❑ *Technical Bulletin 7-93 - Wet Floodproofing Requirements* (FEMA)
- ❑ *Technical Bulletin 8-96 - Corrosion Protection for Metal Connectors in Coastal Areas* (FEMA)
- ❑ *Technical Bulletin 9-99 – Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings* (FEMA)
- ❑ *Technical Bulletin 11-01 – Crawlspace Construction for Buildings Located in Special Flood Hazard Areas* (FEMA)
- ❑ *Tornadoes - Nature's Most Violent Storms* ARC-5002 Dated: 2/95
- ❑ *Using Multi-Objective Management to Reduce Flood Losses in Your Watershed* (ASFPM 1996)
- ❑ *When the Rivers Rise - Flood Awareness for Maine Public Officials* Dated: 1993 (MEMA)

MAINE FLOODPLAIN MANAGEMENT PROGRAM – VIDEO/CD LENDING LIBRARY

- ❑ *Administering Your Flood Damage Prevention Ordinance* (12:00) CA Dept. of Water Res. 1989
- ❑ *Against The Wind: Protecting Your Home From Hurricane Wind Damage* (17:58) ARC
- ❑ *Anchoring Home Fuel Tanks, A presentation of FEMA's Mitigation Division* CD FEMA 481
- ❑ *Best Build I - Constructing A Sound Coastal Home* (19:53) NAHB/FIA/FEMA 1987
- ❑ *Best Build II - Construction in a Riverine Floodplain* (23:38) NAHB/FIA/FEMA 1987
- ❑ *Best Build III - Protecting A Flood-prone Home* (30:00) NAHB/FIA/FEMA 1987
- ❑ *Coastal Construction Manual* CD FEMA-55 Dated: 6/00 Vol. I, II & III
- ❑ *Community Floodplain Management - Part 1 of 2* (1 hr) FIA/FEMA
- ❑ *Community Floodplain Management - Part 2 of 2* (1:42) FIA/FEMA
- ❑ *Community Rating System* (13:00) NFIP
- ❑ *Flood Awareness Teleconference* (2 hrs) MEMA 3/1990
- ❑ *Flood Awareness: Think or Swim* (2 hrs) MEMA 3/1991
- ❑ *Flood Insurance Rating...Covering All the Bases* (23:44) FIA
- ❑ *Flood Mitigation Planning* (31:00) ASFPM 2000
- ❑ *Flooding in Southern Maine/News Report* (15:00) WGME-TV/WCSH-TV 1990
- ❑ *Floodplain Management For Public Officials* (14:00) CA Dept. Of Water Res. 1989
- ❑ *Floodplain: Path of Nature's Power* (20:00)
- ❑ *Hazard Mitigation/Looking Toward the Future* (9:30) FEMA Region I
- ❑ *How to Use NFIP Flood Information* (22:00) PA Dept. Of Community Affairs 1992
- ❑ *Hurricane Information Guide For Coastal Residents* (16:55) American Red Cross
- ❑ *Hurricane: It's NOT Just Another Storm!* (30:00) FEMA
- ❑ *Increased Cost of Compliance - Maine Advanced CEO Training Tape #1*
- ❑ *Increased Cost of Compliance - Maine Advanced CEO Training Tape #2*
- ❑ *Inland Wind Resistant Construction: Upgrading the Wood Frame Home* (11:00) Baxley Media Group
- ❑ *Managing Floodplain Development Through the National Flood Insurance Program Independent Study #9* Emergency Management Institute/FEMA
- ❑ *Mitigation Success Stories 2001* (25:18) FEMA Region I
- ❑ *Multi-Objective Mitigation Planning* (18:36) National Park Service/FEMA 1995
- ❑ *New Brunswick Floods* (10:28) New Brunswick Dept. of Environment 4/1990
- ❑ *New England Hurricane Are You Ready?* FEMA CD
- ❑ *North Carolina Floodplain Management Home Study Course – Tape I* (47:00) NC DEM
- ❑ *North Carolina Floodplain Management Home Study Course – Tape 2* (1:22:00) NC DEM
- ❑ *Out of Harm's Way: An ICC Overview*
- ❑ *Project Impact Mentoring Retreat* (9:48) May 17-19, 1999
- ❑ *River Corridor Stewardship – The Pemigewasset River Story of Flood Hazard Mitigation* (22:00) NHOEM 1999
- ❑ *RSDE 2.0 Residential Substantial Damage Estimator* FEMA 8/01
- ❑ *Substantial Improvements - Maine Advanced CEO Training 1992 Tape #1*
- ❑ *Substantial Improvements - Maine Advanced CEO Training 1992 Tape #2*
- ❑ *The Hidden Danger, Low-Water Crossings* - National Weather Service 1996
- ❑ *The Johnstown Flood - May 31, 1889* (30:00) Charles Guggenheim
- ❑ *The Rainbow Connection* FEMA

If you would like to receive any of the publications on the previous pages or borrow any of the videos shown here, call or write the Maine Floodplain Management Program at the State Planning Office, 38 State House Station, Augusta, Maine 04333, or phone (207) 287-3261. If writing, please be sure to include your name, address, and daytime phone number.

Appendix H
Entry Information

Benefits of Participation in the National Flood Insurance Program (NFIP)

In order to better understand the benefits of participation in the National Flood Insurance Program (NFIP), it is important to consider why the NFIP was initially created in 1968. One of the most important goals of the Program is to break the continual cycle of flooding, damage, and repair. The intent of the NFIP is not to prohibit development, but to guide development in floodplain areas in a manner that is consistent with both nature's need to convey flood waters and a community's land use needs. In order to accomplish this mission, the NFIP began allowing the sale of federally backed flood insurance in communities that adopted regulations containing standards for future development in flood prone areas within the community. A common misconception about the NFIP is that it is a taxpayer supported Program. It is not, as flood insurance claims are paid from the same fund from which premiums are paid. There is a FEMA document titled *Myths and Facts about the NFIP* that addresses some of the common questions regarding flood insurance availability.

Homeowner's insurance does not cover flood damage and federally backed flood insurance is only available in communities that choose to participate in the NFIP. Federal law mandates the purchase of flood insurance for those structures in the SFHA that are being financed by a federally backed lending institution. Participation provides the availability of flood insurance, and hence, solves many of the real estate/lending issues that occur in non-participating communities. Also, as a participating community, every property owner and renter in your community would be eligible to purchase flood insurance, regardless of their location. Approximately 25% of all flood insurance claims come from areas that are outside the mapped floodplain. If the town decided to leave the Program or is suspended from the Program, these policies will not be eligible for renewal and no new policies can be written.

The only "cost" associated with participation in this Program, is the time it takes to continue to administer and enforce the local floodplain management ordinance. The basic premise of requiring permit applications and reviewing all development in the SFHA, is to ensure that improvements are done in such a manner that during the next flooding event, there will be less damage sustained. By adopting regulations for building in flood hazard areas, it is expected that, over time, the floodprone structures in your community will be replaced with stronger more flood damage resistant buildings.

Another very important benefit of participation in the NFIP is that the community is eligible to apply for funds (on a competitive basis) under the 404 Post Disaster Hazard Mitigation Grant program. Also, in the event of a presidentially declared disaster, residents will have access to additional forms of disaster assistance that are not otherwise available in non-participating communities.

The fact that Maine has had mandatory Shoreland Zoning laws on the books for many years has greatly assisted in reducing the amount of non-compliant development in floodplains. In the *State of Maine Guidelines For Municipal Shoreland Zoning Ordinances*, the section on Principle and Accessory Structures requires that "the lowest floor elevation or openings of all buildings and structures including basements have their lowest floor elevated at least one foot above the elevation of the 100 year flood. If the community opts out of the NFIP or is suspended from the Program, they will still be required to enforce basically the same standard as in the Floodplain Management Ordinance.

It is very important to understand the impacts of participation vs. nonparticipation in the NFIP. For more information, please call the Maine Floodplain Management Program at the Dept. of Agriculture, Conservation & Forestry at 287-2801. The regional planning commission in your area is also available to help the town with their floodplain management needs.

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
**APPLICATION FOR PARTICIPATION IN THE NATIONAL FLOOD INSURANCE
PROGRAM**

O.M.B. NO. 1660-0004
Expires: 09/30/2017

PAPERWORK BURDEN DISCLOSURE NOTICE			
Public reporting burden for this form is estimated to average 4 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing, and submitting the form. This collection of information is required to obtain or retain benefits. You are not required to submit to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20472, and Paperwork Reduction Project (1660-0004). NOTE: Do not send your completed form to this address.			
APPLICANT COMMUNITY NAME (City, town, etc.)			DATE
COUNTY, STATE			
COMMUNITY OFFICIAL - CHIEF EXECUTIVE OFFICER (CEO)	E-MAIL ADDRESS	TELEPHONE # (Include area code)	
ADDRESS (Street or box no. city, state, zip code)			
PROGRAM COORDINATOR (Official, if different from above, with overall responsibility for implementing program)	E-MAIL ADDRESS	TELEPHONE # (Include area code)	
ADDRESS (Street or box #., city, state, zip code)			
LOCATION OF COMMUNITY REPOSITORY FOR PUBLIC INSPECTION OF NFIP MAPS			
ADDRESS			
ESTIMATES FOR THOSE AREAS PRONE TO FLOOD AND/OR MUDSLIDE AS OF THE DATE OF THIS APPLICATION			
AREA IN ACRES	POPULATION	NUMBER OF 1-4 FAMILY STRUCTURES	NUMBER OF ALL OTHER STRUCTURES
ESTIMATES OF TOTALS IN ENTIRE COMMUNITY			
	POPULATION	NUMBER OF 1-4 FAMILY STRUCTURES	NUMBER OF ALL OTHER STRUCTURES
FOR FEMA REGIONAL USE ONLY			
FEMA REGIONAL OFFICE	NAME OF CONTACT	TELEPHONE NUMBER	
LEVEL OF 44 CFR 60.3 REGULATION ADOPTED (Check one)		CHECK APPROPRIATE BOX:	
☐ 60.3 ☐ 60.3(b) ☐ 60.3(c) ☐ 60.3(d) ☐ 60.3(e)		☐ EMERGENCY PHASE ☐ REGULAR PHASE	
IF REGULAR PROGRAM, SPECIFY FIRM INDEX DATE. IF USING ANOTHER COMMUNITY'S FIRM, GIVE COMMUNITY NAME, CID, FIRM INDEX DATE AND MAP PANEL NUMBER DEPICTING COMMUNITY			

FEMA FORM 086-0-30

RESOLUTION FOR JOINING THE NATIONAL FLOOD INSURANCE PROGRAM

WHEREAS, certain areas of (Town/City) of _____, Maine are subject to periodic flooding from streams, rivers and lakes, causing serious damages to properties within these areas; and

WHEREAS, relief is available in the form of federally subsidized flood insurance as authorized by the National Flood Insurance Act of 1968; and

WHEREAS, it is the intent of the (Town/City) of _____, Maine to require the recognition and evaluation of flood hazards in all official actions relating to land use in the floodplain areas having special flood hazards; and

WHEREAS, this body has the legal authority to adopt land use and control measures to reduce future losses pursuant to MRSA Title 30A, Sections 3001-3007, 4352 and 4401-4407;

NOW THEREFORE, BE IT RESOLVED that the (Town/City) of _____, Maine Hereby:

1. Assures the Federal Insurance Administration that it will enact as necessary, and maintain in force for those areas having flood or mudslide hazards, adequate land use and control measures with effective enforcement provisions consistent with the Criteria set forth in 44 Code of Federal Regulations Parts 59-61 of the National Flood Insurance Program Regulations; and
2. Vests the Code Enforcement Officer with the responsibility and authority to:
 - (a) Delineate or assist the Administrator, at his request, in delineating the limits of the areas having special flood hazards on available local maps of sufficient scale to identify the location of building sites.
 - (b) Provide such information as the Administrator may request concerning present uses and occupancy of the floodplain area.
 - (c) Cooperate with Federal, State, and local agencies and private firms which undertake to study, survey, map, and identify flood plain or mudslide areas, and cooperate with neighboring communities with respect to management of adjoining floodplain in order to prevent aggravation of existing hazards.
 - (d) Submit on the anniversary date of the community's initial eligibility an annual report to the Administrator on the progress made during the past year within the community in the development and implementation of floodplain area management measures.
 - (e) Notify the Federal Insurance Administrator in writing whenever the boundaries of the community have been modified or the community has otherwise assumed or no longer has the authority to adopt and enforce floodplain management regulations for a particular area. Include with such notification, a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or area which the community has assumed or relinquished authority.
3. Appoints the Code Enforcement Officer to maintain for public inspection and to furnish upon a request a record of elevations in relation to National Geodetic Vertical Datum or North American Vertical Datum of the lowest floor (including basement) of all new or

substantially improved structures located in the special flood hazard areas. If the lowest floor is below grade on one or more sides, the elevation of the floor immediately above must also be recorded.

4. Agrees to take such other official action as may be reasonably necessary and legally appropriate to carry out the objectives of the program.

EFFECTIVE: _____

Date

CERTIFIED BY: _____

Signature

CERTIFIED BY: _____

Print Name

Title

Affix City/Town Seal
(here)

**Order Form for FEMA Flood Maps
On-Line FEMA Flood Maps**



On-Line Flood Insurance Rate Maps

Last Updated: November 19, 2007



Flood Insurance Rate Maps are now online. You can either pay \$1.50 to download an entire map panel or print a portion of the panel as a FIRMette free of charge. A FIRMette is a legally acceptable representation of a portion of the FIRM. **Reading through these instructions carefully before starting will save time and help reduce errors.**

To get to the site, follow these steps. The maps on line are not necessarily digital maps. Most of Maine's maps are scanned FIRMs.

1. Go to www.maine.gov/spo/flood/map and click on FEMA Flood Map Service Center (in the right hand margin) or go directly to <http://store.msc.fema.gov>
[NOTE: unless you are buying products you do not have to log on]
2. Once the screen refreshes, near the center of the screen find the heading **"What are you looking for?"** Click on 'Flood Maps' listed below this heading and complete the following steps:
 1. State - (click the down arrow to the right of the box to select state) (the screen will automatically refresh after you make each selection)
 2. County – (click the down arrow to the right of the box to select the county)
 3. Community (click the down arrow to view the communities located in that county and select community)
 4. Click on Get FEMA issued Flood Maps. Do **not** click on County or Community Kit!!

If the community you selected has a detailed Flood Insurance Study, a list of available online map panels should be displayed. (If only one line is shown go to the end of this document where there will be a discussion regarding Unnumbered A Zone maps). If there are multiple map panels shown, the index panel is the last panel on the list. If you do not know which panel to view, click "view" icon (the magnifying glass) at the end of the line starting with 230...INDO. This is the index panel. It is usually not large enough at the opening view to discern which panel you need. To enlarge the index panel click on the Zoom In icon (the magnifying glass on the left side of the screen with the + sign in it). Then move your cursor to the center of the index map and click again. It may take a couple of clicks to enlarge the index to the point it is readable. Make a note of which panel you want to view. You cannot get directly to the desired panel from this screen. After noting the panel number [for example 2300670012C], close the screen by clicking on the X in the upper right corner of the screen.

This should take you back to the screen that lists the panels available for the community you first selected. Find the panel number on the right side of the screen in the list of panels and then click on the "view" icon. This should open the appropriate map panel. The process for enlarging the map is the same as noted above. Move your cursor to the portion of the map panel you wish to enlarge and click. Then click on the "Zoom In" icon. DO **NOT** click the "Zoom Win". That usually blows the map up too large to see any detail.

There are buttons to the left of the panel image displayed that will also allow you to move around and zoom in or out if you are just going to view and not print the FIRM. If you select the "Make a FIRMette" button, you can manipulate the FIRM to select just that portion of the map you want to print.

To design your FIRMette, follow instructions 1-3 which are shown to the left of the FIRM panel:

1. Select Page Size by clicking on the desired size (recommend using the default size 8½ x 11)
2. Select & Move Areas
 - a. Click on 'Print Area', then click and drag the pink box from the upper left corner to the desired area on the map to be printed.
 - b. To make any necessary adjustments, click on 'Scale & North Arrow'. The corresponding block will turn pink and you can then click and drag it to cover the area to be displayed on the FIRMette (on the approximate A Zone maps, the pink box must be dragged to cover the north arrow).
 - c. Do the same for the 'Title Block', if any adjustment is necessary.
3. Create FIRMette by clicking on Adobe PDF (recommended) or Image File.

The FIRMette will then load and be displayed. Select 'Save Your FIRMette' and save it to the hard drive with an appropriate file name. Once the file has been saved, go to your saved file and the FIRMette can be printed.

Unnumbered A Zone Maps

If there is only one panel displayed, it is an approximate A Zone map and the index and all other panels are contained within that one map file. Do not close the index page on an A Zone map – instead near the top of the screen to the right of the MSC Viewer, 'Page' through to the desired panel. AS you page through the corresponding panels will appear. To enlarge or move around on the panel use the icons on the left side of the screen and to print a FIRMETTE follow the same directions as listed above for the communities with detailed studies.

FEDERAL EMERGENCY MANAGEMENT AGENCY
MAP SERVICE CENTER ORDER FORM
For Flood Maps, Flood Insurance Studies, and Subscriptions

Business Type: Please check the title that corresponds with your business type.

- | | | | |
|--|---|---|---|
| ☐ A1 - FEMA | ☐ B - Appraiser | ☐ I - WYO | ☐ Z2 - Title Co. |
| ☐ A2 - FEMA Contractor | ☐ C - Insurance | ☐ J - Real Estate | ☐ Z3 - Law Firm/Settlement Co. |
| ☐ A3 - Federal Government | ☐ D - Individual | ☐ K - Builder/Developer | ☐ Z4 - Architectural Firm |
| ☐ A4 - State Government | ☐ F - Engineer | ☐ L - Surveyor | ☐ Z5 - Consulting Firm |
| ☐ A5 - Local Government | ☐ G - Lender | ☐ Z1 - Flood Determination | ☐ Z6 - Other: _____ |

NAME

MAP SERVICE CENTER ACCOUNT NUMBER

ORGANIZATION

STREET ADDRESS

CITY

STATE
Maine

ZIP CODE

TELEPHONE NUMBER

FAX NUMBER

Paper Flood Maps: Each map panel cost \$2.00 including index maps. Shipping costs are \$.37 per panel for the first 10 panels plus \$.03 for each additional panel.

ID/Panel No.	Community, County/State	Qty	Price/Panel	Cost
			X \$2.00 =	
			X \$2.00 =	
			X \$2.00 =	

Digital Flood Maps on CD: Each map panel cost \$1.50. Shipping costs are \$3.65 for the first 4 CDs plus \$0.10 for each additional CD.

ID/Panel No.	Community, County/State	Qty	Price/Panel	Cost
			X \$1.50 =	
			X \$1.50 =	
			X \$1.50 =	

Paper Flood Insurance Studies/Floodway Maps (FIS): Each (FIS) cost \$5.00 per study volume plus an additional \$2.00 for each Floodway map. FIS are available as sets only. Shipping costs are \$4.00 for the first FIS plus \$.40 for each additional FIS and \$.37 per panel for the first 10 floodway panels plus \$.03 for each additional panel.

Community ID No.	Community, County/State	Qty Volume	Qty Panel	Total Cost

Digital Flood Insurance Studies/Floodway Maps (FIS): \$4.00 per study plus \$1.50 per floodway. Shipping costs are \$3.65 for the first 4 CDs plus \$0.10 for each additional CD.

Community ID No.	Community, County/State	Qty Volume	Qty Panel	Total Cost

Q3 - Digitized Flood Date Information on CD ROMs: Each CD ROM is \$50. Shipping costs are \$3.65 for the first four (4) CD-ROMs plus \$.10 for each additional CD-ROM.

States	Quantity	Price/CD	Cost
		X \$50 =	

CBRA - Q3 CD ROMs : CD ROMs are \$50 each or all 5 CDs for \$200. Shipping cost is the same as the Q3 above.

States	Quantity	Price/CD	Cost
		X \$50 =	

One-Time Orders

Community Status Book : Individual States cost \$2.50, entire U.S. cost \$20.50. Shipping cost are \$1.00 per state, \$4.26 for the entire U.S.

States	Quantity	Price/State	Cost
		X \$2.50 =	
		X \$20.50 =	

One-Time Orders *(continued)*

Flood Map Status Information Service (FMSIS) : Individual States cost \$13.00, entire U.S. cost \$38.00. Shipping costs are \$3.65 for the first four (4) CD-ROMs plus \$.10 for each additional CD-ROM.

States	Quantity	Price/State	Cost
		X \$13.00 =	
		X \$38.00 =	

Subscriptions

Community Status Book

States	Quantity	Price/State	Cost
		X \$50 =	
		All U.S. \$250 =	

NFIP Insurance Manual

	Quantity	Price Per	Cost
Complete Manual		X \$25.00 =	
Producer's Edition		X \$15.00 =	

Flood Map Status Information Service (FMSIS)

States	Quantity	Price/State	Cost
		X \$148 =	
		All U.S. \$419 =	

Letter of Map Change Distribution Service (LOMC)

	Quantity	Price Per	Cost
		X \$2,000 =	

Shipping costs are included in the subscription cost.

Subscription Sub Total: _____ = _____

Order Sub Total: _____ = _____

Shipping Cost: \$ _____

Total Cost for Order: \$ _____

Orders paid by check can be mailed to: **FEMA/NFIP
Map Service Center
P.O. Box 1038
Jessup, MD 20794-1038**

All other orders can be faxed to: 1-800-358-9620

Payment Information:

☐ Check or money order payable to NFIP is enclosed \$ _____.

☐ Charge my ☐ MC ☐ Visa ☐ Amer. Express Account No. _____ \$ _____

Expiration Date: _____ Signature: _____

☐ Charge my deposit account number _____ \$ _____.

(If you would like assistance in calculating the cost of your order or information about setting up a deposit account, call Customer Service at 1-800-358-9616). All map sales are final - no refunds on material shipped. Overpayment of less than three dollars (\$3.00) is not subject to refund. Visit us online at <http://msc.fema.gov>

Thank you for your order.

Appendix J

Assorted Floodplain Management Articles

Is it in the Floodplain?

by

W. Louis Sidell, Jr.

Maine State Floodplain Management Coordinator

Have you ever given much thought to how important it is to inform a prospective buyer that the property he or she is interested in may be in a floodplain?

Most prospective buyers do not take time (or know how) to investigate whether a property is subject to a hazard. In many cases a property may not be near a stream or shoreline, past flooding may have been minor, or there may be no history of flooding since the area was settled. As a result, many people are caught by surprise when their property is flooded. One of the best times to advise someone of a flood hazard is at the time they are considering the purchase of property.

The municipal offices and the Maine Floodplain Management Program receive frequent calls these days asking the question – Is my property in the floodplain? Many of these inquiries are the result of real estate transactions. The lending institution making the loan is required to protect the loan with National Flood Insurance if the footprint of the structure is in a flood hazard area as identified on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM). Even though this has been a requirement since 1973, many institutions have paid little attention to it in the past. In the late 80's the Federal instrumentalities i.e. FDIC, OTS, FHA, SBA, etc., have been getting the message to the lending community that they must require flood insurance as a condition of the loan on flood prone structures.

Current Federal law requires only that the lender advise a person of the flood hazard and the need to purchase flood insurance within a reasonable time prior to the closing on the loan. This could be well after the buyer has put down earnest money, has lost interest in other properties, and has otherwise become committed to purchasing a property without knowing all the facts. In many states a buyer has recourse under consumer protection laws.

The information for making a determination is available. Approximately 93% of the Maine communities participate in the National Flood Insurance Program (NFIP) and nearly all of Maine's communities have been evaluated as to identifying the flood risk on maps provided to the communities by the Federal Emergency Management Agency (FEMA). These maps are called FIRMs or in some cases FHBMs. Most of the towns have these maps on file in the town office since the maps are an integral part of the Town's Floodplain Management Ordinance. The Regional Planning Commissions around the state also have copies of these maps as well as the State Floodplain Management Program within the State Planning Office in Augusta.

Most towns will not make the determination for you but many will make the map available for your inspection and may help in making the determination. One thing that none of us can do is to make a floodplain determination over the telephone. Because of the possibility of errors in communication over the phone, towns have been advised not to make determinations over the phone unless they feel comfortable with the information being provided by the caller. The FIRMs do not contain individual parcel boundaries and must be used in conjunction with a boundary map or a tax map. If you can read a map and know where the structure is located on the lot, it is not that difficult to make a determination.

The FIRMs can also be ordered from FEMA's map distribution center. There is a nominal charge for the maps, but if you handle a particular region it may well be worth the investment to purchase the maps. The minimum fee is \$2.00 per panel plus shipping. To order the maps you can call 1-800-358-9616 or Fax (800) 358-9620 or you can write: FEMA/NFIP Map Service Center, P.O. Box 1038, Jessup, Maryland 20794-1038.

One of the other benefits of flood hazard disclosure is a possibility for a community to get credit points under an insurance rating system. The Community Rating System allows points for communities that provide initiatives to reduce future flooding damages. If enough credit points are earned, it will result in reduced flood insurance premiums for the residents within that community. Credit is provided if flood hazard disclosure is contained in the real estate listings and if real estate agents advise prospective property purchasers that the property is located in a Special Flood Hazard Area. Other disclosure methods may also be credited.

The objective of the disclosure is to prevent all the troubles that can arise from failing to advise potential purchasers of a flood hazard. In some cases, such a program may protect the real estate agents and sellers from lawsuits. In many cases, it will prevent unwise development of vacant floodprone land.

It is my opinion that it is time for all Maine real estate professionals to implement the flood hazard disclosure and provide a service to the community. For more information please contact The Maine Floodplain Management Program at the State Planning Office, 38 State House Station, Augusta, ME 04333-0038. The phone number is (207) 287-3261.

WHAT IF I SUBDIVIDE IN THE FLOODPLAIN?

by

W. Louis Sidell, Jr.

State Floodplain Management Coordinator

For some time now I have suspected that the problem was bigger than I wanted to admit. Now all the indicators are proving my concerns to be valid.

The problem is that many communities, surveyors and applicants are not consistently following the subdivision review criteria that pertain to land areas that fall within identified Special Flood Hazard Areas also known as the 100-year floodplain.

The State's subdivision review criteria is contained in Title 30-A M.R.S.A. §4404(13). It reads as follows:

13. Flood areas. [The municipal reviewing authority must determine that] Based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant whether the subdivision is in a flood-prone area. If the subdivision, or any part of it, is in such an area, the subdivider shall determine the 100-year flood elevation and flood hazard boundaries within the subdivision. The proposed subdivision plan must include a condition of plan approval requiring that principal structures in the subdivision will be constructed with their lowest floor, including the basement, at least one foot above the 100-year flood elevation;

The Maine Model Floodplain Management Ordinance provides the following:

The Planning Board shall, when reviewing subdivisions and other proposed developments that require review under other federal law, state law or local ordinances or regulations and all projects on 5 or more acres, or in the case of manufactured home parks divided into two or more lots, assure that:

- A. All such proposals are consistent with the need to minimize flood damage.
- B. All public utilities and facilities, such as sewer, gas, electrical and water systems are located and constructed to minimize or eliminate flood damages.
- C. Adequate drainage is provided so as to reduce exposure to flood hazards.
- D. All proposals include base flood elevation and, in riverine floodplain, floodway data.
- E. Any proposed development plan shall include a statement that the developer will require that structures on lots in the development be constructed in accordance with Article VI of this ordinance and that such requirement will be included in any deed, lease, purchase and sale agreement, or document transferring or expressing an intent to transfer any interest in real estate or structure, including but not limited to a time- share interest. The statement shall clearly articulate that the municipality may enforce any violation of the construction requirement and that fact shall also be included in the deed or any other document previously described. The construction requirement shall also be clearly stated on any map, plat, or plan to be signed by the Planning Board or local reviewing authority as part of the approval process.

The problem first came to my attention as a result of some of the Community Assistance Visits and workshops I have conducted around the State. Then a surveyor called to my attention the fact that a vast majority of the subdivisions he had come across while doing Mortgage Inspections had areas within the floodplain but had been reviewed & approved without the required floodplain data or required construction standards and deed restrictions placed on the affected lots, i.e., the required floodplain boundary nor the notice of lowest floor elevation.

I discussed this issue with the Attorney General's (AG's) Office and with the Maine Municipal Association (MMA). The conclusions were the same from both agencies. We appear to have a subdivision compliance problem.

Both agencies agree that a town could be sued for failure to attach the requisite conditions to a subdivision permit. Buyers of lots in subdivisions which are granted approval without the conditions may have either a real flood hazard or at the very least a cloud on their title.

Financing a structure that has been identified as being in a Special Flood Hazard Area has added difficulties. In order to get financing from a federally regulated lender, i.e. a bank insured by the FDIC, flood insurance must be purchased as a condition of the loan by federal law. If the community does not participate in the National Flood Insurance Program (NFIP) it becomes difficult if not impossible to get financing. Buyers of lots in floodplains should be finding out about the potential hazards and restrictions that may be associated with the property long before they get to the bank.

Another issue in the State's subdivision review criteria, item number 13, involves the language that states, "The subdivider shall determine the 100-year flood elevation and flood hazard boundaries within the subdivision." Often the Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM) that is involved does not provide a base flood elevation for easy reference and mapping when the applicant needs to put the 100-year boundary and elevation on the subdivision plat. MMA concurs with the State Floodplain Management Coordinator's opinion that if the map has an unnumbered A Zone (a mapped floodplain with no associated flood elevation) then it is the developer's (applicant's) responsibility to determine the 100-year flood elevation. This requires the additional expense of hiring an engineer or hydrologist. Although the law does not stipulate how the developer is to determine the 100-year flood elevation, I would add that it is in the town's and the developer's best interest to make the determination based on engineering practices recognized by the Federal Emergency Management Agency (FEMA). That way if the data is credible there is a possibility that we can convince FEMA to revise the Flood Insurance Rate Map (FIRM) for the community based on the existing data. This will not only benefit the community in other permitting functions but may assist surveyors when doing future map determinations on other local properties for lending institutions and/or homeowners.

To date, I am aware of only two Maine communities that have actually "recalled" an already approved subdivision once they learned of the omitted requirements. In one case, lots had already been sold. If you have a situation in your town where a subdivision has been approved contrary to the requirements I recommend that you call your town attorney to discuss the proper procedure for handling such issues.

MMA has offered the following "boilerplate" condition of approval as contemplated by 30-A M.R.S.A. §4404 (13):

This approval is granted subject to the following condition(s):

1. If this plan shows the subdivision or any portion of it to be within a flood hazard area, all principal structures hereafter constructed or placed therein shall be so located that their lowest floor, including basement, is at least one foot above the 100-year flood elevation.

MMA further recommended that such language would be most appropriate if located near the signature block on the recording plat.

It should be noted that under the NFIP the Federal government establishes the minimum standards for development in the Special Flood Hazard Areas. States can be more restrictive in their regulations and the communities in turn can be more restrictive than the Federal or state standards. This is certainly the way it is working in Maine. The standard in Maine's model Floodplain Management Ordinance is slightly more restrictive than the Federal regulation found in the NFIP Regulations at 44 CFR Part 60.3(a) (4) and 60.3(b) (3). The NFIP Regulations only place the base flood elevation data requirement on subdivisions or other proposed developments of greater than 50 lots or 5 acres, whichever is the lesser. Maine's requirement is by choice more restrictive. You may find in some instances that the community has opted to be even more restrictive. It pays to check with each community to see what its ordinance requires.

If you have any floodplain management questions they should be directed to the staff of the Maine Floodplain Management Program at the State Planning Office, 38 State House Station, Augusta, Maine 04333-0038 or (207) 287-3261.

THEY JUST DON'T GET IT

By

W. Louis Sidell, Jr.

Maine Floodplain Management Coordinator

I don't know if you saw the recent piece on NBC's Fleeing of America, but for the second time in a month, NBC took a major swing at the National Flood Insurance Program. Aside from some very misleading "reporting", I think they are completely missing the concept of what the NFIP has done to mitigate flood damages.

According to the February 24th evening report, the NFIP is fleecing the American Taxpayer because there are insured individuals that are getting flooded, suffering damages and cashing in on claims to repair their home exactly the way it was, and then doing it all over again a few months later. Admittedly we have a problem with repetitive losses. But let's get the story straight. FEMA, Congress and communities are working to turn this problem around.

The National Flood Insurance Program is the Granddaddy of the oft' touted mitigation measures. Congress passed the National Flood Insurance Act in 1968 and laid the ground work for a program that has had many great successes. It is, like all programs, not perfect, but it is a Program that has been flexible to the changing needs of the policy holders, the communities, and states in efforts to break the flood/rebuild/flood cycle that has for years plagued society.

The major underlying purpose of the NFIP is to break the cycle. Flood insurance is made available in those communities that have agreed to regulate development in Special Flood Hazard Areas. In addition, by creating an insurance pool fed by those that are at risk, the cost of the risk is taken off the backs of the taxpayer and is funded by those paying the premiums.

The NFIP is not a taxpayer burden. The Program is designed to operate in the black during a normal loss year. This is to say that the Program runs on Flood Insurance premium income, not taxpayer money out of the U. S. Treasury. When the Program has an unusually heavy year in losses, it can and does borrow from the treasury. But it is paid back with interest.

According to a recent FEMA press release, dated February 24, 1998, FEMA Director James Lee Witt is quoted, "flood insurance claims and operating expenses are funded by policyholder premiums, not by tax dollars. We estimate that the NFIP saves an estimated \$800 million annually in taxpayer dollars that would otherwise be spent on flood disasters."

Witt pointed out that part of the savings comes from reduction in flood damage due to NFIP building standards. He said government data shows that structures built after a community joins the NFIP are 75 percent less likely to suffer flood damage than those built before those standards were adopted.

For over 25 years now, the NFIP has required new buildings to be elevated or floodproofed to a 100-year flood design standard. Over 18,700 communities have decided to participate in the National Flood Program and their ordinances reflect this requirement. In addition it has been a long standing NFIP development requirement for local ordinances to reflect that, if a structure is substantially damaged or improved, it must be made flood resistant. This usually translates into elevating the building with its lowest floor above the 100-year flood elevation. Substantially damaged buildings also qualify for FEMA-funded acquisition or relocation programs. The NFIP policy holders fund many of these projects. FEMA and Congress have pumped additional money into efforts to move buildings out of harms way. It is unrealistic, however, to expect overnight elimination of the problem. We didn't get into this problem overnight.

It is unfortunate that shortsighted reporting continues to feed a public perception that all government programs are big, bad and wasteful when in fact here is a program that is saving the U.S. taxpayer money and who knows, maybe even saving a few lives by encouraging people to build smart.

HUGO'S LESSONS ON CONSTRUCTION NFIP STANDARDS WORK

by

W. Louis Sidell, Jr.

Maine Floodplain Management Coordinator

If there is any good news to come out of the Hurricane Hugo, it may be that the National Flood Insurance Program (NFIP) standards for construction in high hazard coastal areas, Zones V, V1-30 or VE do work. On more than one occasion in South Carolina a house was left standing next to one that was totally destroyed. It was not an error on nature's part. She really tried to demolish everything in her path with winds exceeding 100 mph and storm surges in excess of 15 feet in some areas.

The houses left standing in these unusual circumstances were built to meet the minimum standards of the Coastal Construction Manual, a Federal Emergency Management Agency (FEMA) publication, (FEMA-55/February, 1986). In a few instances there were reports that houses built in communities that did not adequately enforce their ordinances did not survive the storm. At the National Committee on Property Insurance (NCPI) ¹ Annual forum in December of 1995, Dr. Neil Frank, the famed meteorologist and hurricane authority, and Billy Manning, Director of Engineering and Education for the Southern Building Code Congress, gave several examples of structural failure during hurricanes. Several examples were shown where the mechanical fasteners (hurricane clips) were undersized or in some cases the clips were not corrosion resistant and the salty environment had substantially reduced their strength and they subsequently failed in the high winds. In other examples, the clips were too light or not sized properly to the job. Inadequate bracing was another common failure. A frequent code deficiency was lack of exterior wall fastening requirements. Adequate codes and proper inspection during construction was the key to many of those that survived not only Hugo but prior hurricanes as well. It was found after some of the buildings were destroyed that they were not built as engineered. Someone tried to save a buck and shave corners. One of the most severe code deficiencies pointed out at this one day meeting was the lack of standards for the proper erection of signs. They were often cited as the source of significant damage because they turn into missiles during high winds.

COMMON COMMUNITY ERRORS IN FLOODPLAIN MANAGEMENT

by
W. Louis Sidell, Jr.
Maine Floodplain Management Coordinator

One of the many responsibilities of the State Floodplain Management Program is to conduct Community Assistance Contact (CACs) and Community Assistance Visits (CAVs). The purpose of these calls and visits is to assess the community's floodplain management program and to determine if the community is having any problem with administering or enforcing it. For the most part Maine communities take their responsibilities seriously and they believe in sound floodplain management. However, there are some problems that occur more frequently than others.

Communities should require permits for all development in the floodplain. A few communities were under the impression that permits were only required for substantial improvements. It might be wise to sit down and read the floodplain management ordinance definition of development. It is a very broad definition, and, for those communities that have adopted the Model Ordinance, a permit is required for all development.

Permit record keeping is another problem. In order to properly rate structures for insurance coverage, one of the most important sources of information is the community's floodplain permit records. This record should show:

1. When the structure was built. This is necessary to determine which rating table to use, Pre-FIRM (before the effective date of the FIRM Map) or Post FIRM (after the effective date of the FIRM Map).
2. Is the structure in the floodplain and if it is, what is the zone and the Base Flood Elevation (BFE)?
3. What is the lowest floor elevation? This is the most critical of records to keep and to be able to retrieve when requested. Elevation Certificates are required in order to close out a floodplain permit for structures. These certificates are necessary to rate new construction. Note that the lowest floor means the floor of any enclosed area over 3 feet in depth.

Keep in mind that structures which are non-compliant may be denied coverage or those built as a result of a variance may end up paying exorbitant rates that may seriously affect the market value, because the prospective purchaser may be required to buy flood insurance as a condition of the loan.

If you have a problem understanding your ordinance or how to apply it to certain circumstances, call the Maine Floodplain Management Program at the State Planning Office. The number is 287-3261.

Flood Hazard Determination Issues

So they say you are in the Flood Zone!

The Federal Emergency Management Agency, or FEMA, has studied and mapped the floodplains of the United States and delineated them as 'Special Flood Hazard Areas' (100-year floodplains) on county/community Flood Insurance Rate Maps (FIRMs). In Maine, these maps are published for each separate city and town except in areas where FEMA deemed there was not enough risk or development to warrant the cost of mapping. The maps, which show roads, waterbodies, and the shaded floodplains zones, are used by the local officials of communities that participate in the National Flood Insurance Program for land use and permitting purposes. They are also used by lenders for making map determinations, and by insurance agents for rating flood insurance policies. Most FIRMs are based on a detailed flood study, however, there are a number of Maine communities where full studies have not been completed, and less technical data has been used to map the floodplains. The FIRMs are reasonably successful in showing the areas determined to be within the 100-year floodplain, sometimes however, they contain inadvertent errors. This is often caused by the lack of availability of a highly detailed base map, map scale, and changes to the landscape, not necessarily by the lack of quality of the actual flood data. As with any mapping process, occasionally there are errors. FEMA recognizes this potential and has developed a process to deal with this issue.

The Flood Disaster Protection Act of 1973 and the 1994 Reform Act made flood insurance mandatory as a condition of a loan on any structure located within a 100-year floodplain. The lender is responsible for making a flood map determination on every loan for improved real estate (unless the original loan balance is \$5,000 or less and has a repayment term of less than one year). Most lenders contract with a private company to complete these determinations. Most of the companies are very large national firms that do vast numbers of these determinations quickly, cheaply, and without the benefit of local knowledge, i.e., information about where the structure sits on the lot. The lenders and map determination companies must use the current FEMA flood map and make a purely horizontal determination on whether the structure is in, or out of the mapped floodplain. *(For the purpose of these determinations, ground and house elevations at the site may not be taken into consideration.)* The findings of these determinations are sometimes not shared with the borrower until just days or hours before the closing. Often, people are surprised to learn that their property is in a flood zone and that they must purchase a separate flood insurance policy before they can close and continue that coverage for the term of the loan.

O.K., I agree I'm in the Flood Zone, but how do I get insured?

Flood insurance is NOT covered under a regular Homeowners policy - it must be purchased separately. It is available through any insurance agent/agency, who may write it directly through the National Flood Insurance Program (NFIP) or place the coverage through one of the many "Write Your Own" companies. Many of these WYO companies are the same ones that offer homeowner's policies, but the flood coverage is actually reinsured through the NFIP. Homes built before a community's first FIRM are given a somewhat subsidized rate that is not based on their elevation, but homes built after the first FIRM became available for that town must be rated based on the completion of an Elevation Certificate (FEMA Form 81-31). It is the same form that the local building official requires for the permitting of a newly constructed or substantially improved structure. Completion of the Elevation Certificate requires a Professional Land Surveyor and asks for a variety of elevations at the actual structure, such as lowest floor, lowest adjacent grade, highest adjacent grade, elevation of mechanicals, and of course the elevation of the 'base flood' (100-year flood) as shown on the FIRM.

No way, I'm not in a flood zone!

It is not a perfect world. As stated earlier, FEMA's maps aren't 100% accurate, and while the vast majority of the determinations done by map determination companies are correct, they can make errors. We recommend the steps

outlined in the section below when a flood determination is in question. Methods 1 & 2 apply to those cases where there are problems with the horizontal determination. Only method 3 is appropriate when vertical elevation becomes an issue. [Remember that the lender is only responsible, by federal law, for making a horizontal determination based on the current FIRM and may not base a determination on elevation data, unless a LOMA has been issued based on an Elevation Certificate and other supporting documentation.]

Inaccurate determinations and how to deal with them!

Here is an example of the type of question that we are so frequently asked:

"I'm dealing with a situation where a bank is insisting on flood insurance for buildings which are NOT in the shaded flood area shown on the flood map, based on a "flood hazard determination" from out of state. Somehow the bank seems to feel that the opinion of an anonymous computer operator from away is superior to that of a Maine licensed professional who has been to the site. Do the banks have some discretion in this area? Or are they required to proceed this way?"

Here to fore the Flood Hazard Determination Companies with whom the lending institutions contract, are an unregulated industry. However, the industry has most recently implemented a certification process to improve the quality of their profession. It can be difficult for property owners who are attempting to get (re)mortgages and equity loans to deal with the issues surrounding determinations. There is no one answer to the problem posed above, but rather a list of possible options.

According to the federal regulations under the NFIP governing the lending institution, the ultimate responsibility for flood hazard determinations lies with the lender, even if they subcontract that work out to a vendor. A lender has the legal ability to override an inaccurate determination completed by a vendor if the lender has certifiable information obtained from another source. The standard process that most banks follow is to have their vendor reconsider the determination based on the submission of the additional documentation. In the vast majority of these situations, the issue is resolved satisfactorily.

If the property owner/borrower disagrees with the lender's/vendor's determination there are 3 courses of action [remember only the last method is appropriate when elevation data is to be taken into consideration]:

1) Provide the loan officer with information from a local official and sometimes information from a surveyor, which demonstrates the footprint of the structure is horizontally outside the Special Flood Hazard Area (SFHA). This can be accomplished with a copy of the flood map, tax map, and lot site plan (depending on the closeness of the call this site plan may or may not need surveyed measurements). In some cases it is clearly evident (without extensive surveying) that the structure lies outside the SFHA. In most instances, the lender will forward that information to the map determination company, who will then revise their determination. If not, ask the loan officer to consider the determination and make the decision locally. Some lenders may accept this documentation and fill out their own Flood Hazard Determination Form.

2) There is a Letter of Determination Review (LODR) process, where the lender and property owner agree to submit documentation to FEMA for review. Unfortunately, there is an \$80 fee for this review, which is normally paid by borrower. We usually don't recommend this option because of the fee and because the review only rules on the horizontal determination and will not take into consideration any elevation data.

3) If option 1 & 2 don't work for horizontal disputes, or when a naturally elevated area has been inadvertently included in the mapped floodplain, we recommend that the property owner work with a surveyor to complete an Elevation Certificate and LOMA application for FEMA's review. There is no federal fee for the review or processing of LOMAs. In some extreme cases we have even heard that FEMA might review a LOMA application without elevation information, when it can be clearly shown that the structure is horizontally way outside the floodplain. Certified elevation information is always required when the review is to be based on vertical elevation

and not horizontal considerations. Unfortunately the LOMA process can take quite a few weeks (maximum of 60 days if FEMA has all the needed data) and can hold up the closing of a loan. We normally recommend that if the borrower wants or needs to close on the loan, they should go ahead and purchase the flood insurance. If the LOMA is granted, the federal requirement for flood insurance is removed. If a bank has no other internal policy requiring insurance then the coverage may be cancelled and the property owner may receive a full refund.

We encourage the public and other professionals to seek assistance if they question the flood hazard determination for their property. The staff of the Maine Floodplain Management Program is available for providing information and resources regarding these mapping and determination issues. Also, please check out our website for a wealth of information and links www.maine.gov/spo/flood. Our site is very comprehensive, containing a multitude of data, forms, publications, and links to such things as: FEMA Forms (Elev. Cert. and LOMA/LOMRs); Best Available Data; View and Print Flood Maps; Development in Approximate A Zone Areas; the Maine Floodplain Management Handbook; and Contact the Maine Floodplain Management Program.

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Maine Floodplain Management Program  
State Planning Office  
38 State House Station,  
184 State Street, Augusta, Maine 04333-0038  
voice: 207-287-3261 fax: 207-287-6489  
[www.maine.gov/spo/flood](http://www.maine.gov/spo/flood)

## **Base Flood Elevation Determination in Unnumbered A Zones**

The following is a list of acceptable methods that the Federal Emergency Management Agency (FEMA) recognizes for determining flood elevations for regulation of development in A Zones that have no published base flood elevations (BFE).

1. Don't reinvent the wheel! Check the Maine Floodplain Management Programs website for the Best Available Data (BAD). The URL is <http://www.maine.gov/spo/flood/bad/>. You may click on the appropriate letter of the alphabet that begins the name of your community. If we have a BFE determined for the waterbody that you need we will post it here.
2. If a waterbody forms a boundary between two communities, the community on the other side of the river, lake or pond may have a detailed study. The base flood data for one side is valid for both sides. As we find these, they are being posted in the BAD listing on our website.
3. Hire a professional Engineer to run the appropriate flood model and establish the BFE in the most scientific and defensible way. The most common riverine model is HEC/RAS developed by the US Army Corps of Engineers. It is the model used in most of Maine's Flood Insurance Studies done by FEMA for our communities along rivers. Other models are appropriate for lakes, ponds, and wetlands and a different model is appropriate for ocean exposure.
4. Check with the state and federal agencies such as US Army Corps of Engineers, USDA/Soil Conservation Service, or USGS and ask if they have knowledge of any base flood elevation reports or other unpublished reports or data that may be of assistance for the stream in question.
5. If the property is along a stream that is near any state highway structures such as bridges or culverts, the Maine Department of Transportation sometimes may have done a study to properly size the structure. Call the bridge design section of DOT to ask.
6. If there is a dam on the waterbody there is a good possibility that the dam owner has had to do a study to get relicensed.
7. Maine law requires developers of new subdivisions to provide base flood data if the subdivision is in a mapped floodplain. Check with the town to see if there have been any new subdivisions near the site in question. The recorded plan should have the BFE and floodplain boundary on it.
8. The Best Fit approach: Compare the shaded area of the Flood Insurance Rate Map (FIRM) with the contours on a USGS Quad map and determine which two contours the boundary of the shaded area falls between and interpolate which contour best approximates the boundary of the shaded area and use that contour and the elevation as the regulatory flood elevation. This is best done by someone familiar with contour mapping and that is familiar with "the lay of the land" in question.
9. Another method is the use of historical records or the flood of record. Once you know the date of the flood of record you may be able to establish that flood's return frequency by looking at the river basin report on the Maine Floodplain Management Website <http://www.maine.gov/spo/flood/> to see if a return frequency has been established for the event. You will first need to establish which major river basin your area is located or you may contact the USGS or National Weather Service (NWS) and ask if they have the return frequency for that specific event. If the event is less than the 100-year flood the elevation information is not appropriate for determining the needed BFE.

If you have any questions in regard to the above please contact the Maine Floodplain Management Program at (207) 287-3261, (800) 662-4545 or fax: (207) 287-6489

**Appendix K**  
**Biennial Report**

DEPARTMENT OF HOMELAND SECURITY  
EMERGENCY PREPAREDNESS AND RESPONSE DIRECTORATE  
NATIONAL FLOOD INSURANCE PROGRAM

Biennial Report for  
Calendar Year 2003 and 2004

**REGULAR PROGRAM**  
**(With Base Flood Elevations)**

O.M.B. No. 1660-0003  
Expires **October 31, 2005**  
**JUNE 30, 2007**  
See reverse side for  
Paperwork Burden Notice

RETURN TO:  
Federal Emergency Management Agency  
Biennial Report Coordinator  
3601 Eisenhower Avenue  
Alexandria, VA 22305

**Instructions**

1. This report should be completed by the locally designated Floodplain Manager (e.g. your Community Manager, Community Planner, Building Inspector, etc.)
  2. Please return this report within **45 days** of receipt to the address above, or fax it to 1-800-NFIP-BR1. If you would like to respond via the Internet, go to [www.floodmaps.fema.gov/2005](http://www.floodmaps.fema.gov/2005) and use the following PIN number: \_\_\_\_\_
- For more information, contact the FEMA Map Assistance Center toll free at 1-877-FEMA 114 (1-877-336-2114).

**SECTION I - Changes in your community that may have affected flood hazard areas:**

*If you answer "yes" to any question in this section, please be prepared to provide explanatory information and/or technical data including, when appropriate, your own community map or a copy of the Flood Insurance Rate Map showing the areas affected. Do not send this information at this time. FEMA may contact you by phone in the near future for this information.*

- |                                                                                                                                                                                                                                                          | YES                      | NO                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| A. Does your community have any changes to the base data on your Flood Insurance Rate Maps? (e.g. adding/correcting streets, adding Letters of Map Revision, or annexations/corporate limit changes)                                                     | <input type="checkbox"/> | <input type="checkbox"/> |
| B. Have the characteristics of watersheds in your community changed to the extent that your floodplain needs to be restudied? (e.g., major landuse changes due to urbanization, deforestation, wildfires, or stream relocation due to erosion/siltation) | <input type="checkbox"/> | <input type="checkbox"/> |
| C. Does your community have information that may be incorporated into Flood Insurance Insurance Rate Map? (e.g., watershed studies or Base Flood Elevations established by developers)                                                                   | <input type="checkbox"/> | <input type="checkbox"/> |
| D. Has there been a significant man-made change affecting your designated flood hazard areas? (e.g., levees, bridges, culverts, extensive filling, excavation or stream channelization)                                                                  | <input type="checkbox"/> | <input type="checkbox"/> |

**SECTION II - Community Floodplain Management Data during the last 2 years (calendar 2003-2004 only):**

- A. Has your community updated its floodplain management ordinance during the reporting period? If so, please send a copy of the new ordinance to the return address identified above. ☐ YES ☐ NO
- B. How many building **permits** were granted within the last 2 calendar years for new structures (including substantial improvements to existing structures) in the designated flood hazard areas shown on your community's Flood Insurance Rate Map?
- C. How many **variances** to your local floodplain management ordinance were granted within the last 2 calendar years for new structures or substantial improvements to existing structures in the designated flood hazard areas shown on your community's Flood Insurance Rate Map? Please provide **ONLY** the number of variances granted for structures with the lowest floor below the Base Flood Elevation.
- D. Is your community in need of technical assistance in improving local floodplain management, such as regulation interpretation, planning, enforcement procedures, floodproofing, or a community visit? ☐ YES ☐ NO
- E. Please update the demographic information on your community that was provided to FEMA when your community last reported to the National Flood Insurance Program. If any numbers are NOT correct or a "0" appears, please provide the revised number in the space below. If precise data is not available, please give us your best estimate.

|                                                                                                                                                                                                                                                    | Permanent Year-Round Population | 1-4 Family Structures         | All Other Structures  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------|-----------------------|
| 1. In your <u>entire</u> community (including flood hazard areas)                                                                                                                                                                                  |                                 |                               |                       |
| 2. In your flood hazard areas <u>only</u> .                                                                                                                                                                                                        |                                 |                               |                       |
| 2b. How did you determine the number of structures in the flood hazard areas?<br><input type="checkbox"/> GIS data <input type="checkbox"/> best estimate <input type="checkbox"/> tax map overlays <input type="checkbox"/> other (explain) _____ |                                 |                               |                       |
| NAME, TITLE, AND SIGNATURE AND E-MAIL ADDRESS                                                                                                                                                                                                      |                                 | PHONE NO. (include area code) | DATE<br>MONTH    YEAR |

### PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5-3 hours per response. The burden estimates includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Emergency Preparedness and Response Directorate, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (1660-0003). **Note: Please do not send your completed form to the above address.**



# EXECUTIVE ORDER 11988

## FLOODPLAIN MANAGEMENT

May 24, 1977

[EDITOR'S NOTE: Executive Order 12148 -Federal Emergency Management, July 20, 1979, substituted "Director of the Federal Emergency Management Agency" for "Federal Insurance Administration" in Section 2(d).]

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of the National Environmental Policy Act of 1969, as amended (42 USC 4321 et seq.), the National Flood Insurance Act of 1968, as amended (42 USC 4001 et seq.), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975), in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, it is hereby ordered as follows:

### SECTION 1

Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

### SECTION 2

In carrying out the activities described in Section 1 of this Order, each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management; and to prescribe procedures to implement the policies and requirements of this Order, as follows:

- (a) (1) Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain ~ for major Federal actions significantly affecting the quality of the human environment, the evaluation required below will be included in any statement prepared under Section 102(2)(C) of the National Environmental Policy Act. This determination shall be made according to a Department of Housing and Urban Development (HUD) floodplain map or a more detailed map of an area, if available. If such maps are not available, the agency shall make a determination of the location of the floodplain based on the best available information. The Water Resources Council shall issue guidance on this information not later than October 1, 1977.
- (2) If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.
- (3) For programs subject to the Office of Management and Budget Circular A-95, the agency shall send the notice, not to exceed three pages in length including a location map, to the state and area wide A-95 clearinghouses for the geographic areas affected. The notice shall include: (i) the reasons why the action is proposed to be located in a floodplain; (ii) a statement indicating whether the action conforms to applicable state or local floodplain protection standards and (iii) a list of the alternatives considered. Agencies shall endeavor to allow a brief comment period prior to taking any action.

- (4) Each agency shall also provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order No. 11 514, as amended, including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended.
- (b) Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in a floodplain, whether the proposed action is in accord with this Order.
  - (c) Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loan or grants-in-aid programs that they administer. Agencies shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in floodplains prior to submitting applications for Federal licenses, permits, loans or grants.
  - (d) As allowed by law, each agency shall issue or amend existing regulations and procedures within one year to comply with this Order. These procedures shall incorporate the Unified National Program for Floodplain Management of the Water Resources Council, and shall explain the means that the agency will employ to pursue the nonhazardous use of riverine, coastal and other floodplains in connection with the activities under its authority. To the extent possible, existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, shall be utilized to fulfill the requirements of this Order. Agencies shall prepare their procedures in consultation with the Water Resources Council, the Director of the Federal Emergency Management Agency, and the Council on Environmental Quality, and shall update such procedures as necessary.

### SECTION 3

In addition to the requirements of Section 2, agencies with responsibilities for Federal real property and facilities shall take the following measures:

- (a) The regulations and procedures established under Section 2(d) of this Order shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the standards and criteria and to be consistent with the intent of those promulgated under the National Flood Insurance Program. They shall deviate only to the extent that the standards of the Flood Insurance Program are demonstrably inappropriate for a given type of structure or facility.
- (b) If, after compliance with the requirements of this Order, new construction of structures or facilities are to be located in a floodplain, accepted flood proofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land.
- (c) If property used by the general public has suffered flood damage or is located in an identified flood hazard area, the responsible agency shall provide on structures, and other places where appropriate, conspicuous delineation of past and probable flood height in order to enhance public awareness of and knowledge about flood hazards.
- (d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

#### **SECTION 4**

In addition to any responsibilities under this Order and Sections 202 and 205 of the Flood Disaster Protection Act of 1973, as amended (42 U.S.C. 4106 and 4128), agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in a floodplain shall, prior to completing action on such transaction, inform any private parties participating in the transaction of the hazards of locating structures in the floodplain.

#### **SECTION 5**

The head of each agency shall submit a report to the Council on Environmental Quality and to the Water Resources Council on June 30, 1978, regarding the status of their procedures and the impact of this Order on the agency's operations. Thereafter, the Water Resources Council shall periodically evaluate agency procedures and their effectiveness.

#### **SECTION 6**

As used in this Order:

- (a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting floodplains.
- (b) The term "base flood" shall mean that flood which has a one percent or greater chance of occurrence in any given year.
- (c) The term "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

#### **SECTION 7**

Executive Order No. 11296 of August 10, 1966, is hereby revoked. All actions, procedures, and issuances taken under that Order and still in effect shall remain in effect until modified by appropriate authority under the terms of this Order.

#### **SECTION 8**

Nothing in this Order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

#### **SECTION 9**

To the extent the provisions of Section 2(a) of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended.

/s/Jimmy Carter  
THE WHITE HOUSE  
May 24, 1977

## **Appendix M**

### **Benefits of Participation in the NFIP Community Rating System and Effects of Suspension From the NFIP**

## **Benefits of Participation in the National Flood Insurance Program (NFIP)**

In order to better understand the benefits of participation in the National Flood Insurance Program (NFIP), it is important to consider why the NFIP was initially created by Congress in 1968. One of the most important goals of the Program is to break the continual cycle of flooding, damage, and repair. The intent of the NFIP is not to prohibit development, but to guide development in floodplain areas in a manner that is consistent with both nature's need to convey flood waters and a community's land use needs. In order to accomplish this mission, the NFIP began allowing the sale of federally backed flood insurance in communities that adopted regulations for future development in flood prone areas. A common misconception about the NFIP is that it is a taxpayer supported Program. Flood insurance claims are paid from the same fund to which premiums are paid. The Program has authority to borrow from the federal treasury, which it sometimes does if the Program has a higher than normal year of losses. However, any money borrowed is paid back with interest. To date Congress has not forgiven the loan to the Program for the massive claims that were paid out due to Hurricane Katrina in 2005. Much of the premiums collected by the Program since Katrina are paying for the interest on that loan. There is a FEMA document titled *Myths and Facts about the NFIP* that addresses some of the common questions regarding flood insurance availability.

Homeowner's insurance does not cover flood damage and federally backed flood insurance is only available in communities that choose to participate in the NFIP. Federal law mandates the purchase of flood insurance for those structures in the SFHA that are being financed by a federally backed lending institution (see FEMA 186/May 1997 *Mandatory Purchase of Flood Insurance Guidelines*) Participation provides the availability of flood insurance, and hence, solves many of the real estate/lending issues that occur in non-participating communities. Also, as a participating community, every property owner and renter in the community would be eligible to purchase flood insurance, regardless of their location. Approximately 25% of all flood insurance claims come from areas that are outside the mapped floodplain. But while 25% is a substantial percentage it accounts for only approximately 2% of the claims paid out. If a town decides to leave the Program or is suspended from it, the current flood insurance policies could not be eligible for renewal and no new policies could be written.

The only "cost" associated with participation in this Program, is the time it takes to continue to administer and enforce the local floodplain management ordinance. The basic premise of requiring permit applications and reviewing all development in the SFHA is to insure that improvements are done in such a way that they will help mitigate future flood damages. It is expected that, over time, the floodprone structures in your community will be replaced (or improved) with stronger, more flood resistant buildings or materials.

Another very important benefit of participation in the NFIP is that the community is eligible to apply for federal funds (on a competitive basis) under the 404 Post Disaster Hazard Mitigation Grant program. Also, in the event of a presidentially declared disaster, residents will have access to disaster assistance funds that are not otherwise available in non-participating communities.

The fact that Maine has had mandatory Shoreland Zoning laws on the books for many years has greatly assisted in reducing the amount of non-compliant development in floodplains. In the *State of Maine Guidelines For Municipal Shoreland Zoning Ordinances*, the section on Principle and Accessory Structures requires that the first floor elevation or openings of all buildings and structures including basements have their lowest floor elevated at least one foot above the elevation of the 100 year flood, or similar standard. Consequently, if the community opts out of the NFIP or is suspended from the Program, they it will still be required to enforce basically the same standard as in the floodplain management regulations.

It is very important to understand the impacts of participation vs. nonparticipation in the NFIP. For more information, please call the Maine Floodplain Management Program at 287-3261 or visit the Program's website at [www.maine.gov/spo/flood](http://www.maine.gov/spo/flood)

## **COMMUNITY RATING SYSTEM (CRS) PARTICIPATION A FURTHER BENEFIT**

Some Maine communities are already taking advantage of the CRS Program which recognizes community efforts that go beyond the NFIP minimum standards by reducing flood insurance premiums for the community's property owners. All communities participating in the NFIP start out as a Class 10. Each accumulation of 500 points gives the residents in your town a 5% reduction on flood insurance rates. Points are awarded based on credible activities being undertaken in the community.

A couple of Maine examples:

The Town of Wells has earned a Class 9 under the CRS, which translates to a 5% premium savings on every flood insurance policy in Wells. As of 07/23/07, there are 820 flood insurance policies in force in Wells and the total premium savings due to the CRS credit is approximately \$29,000! The average flood insurance policy holder in the floodplain in Wells saves approximately \$48 on their annual premium which would cost about \$915 annually without the town's CRS credit. If Wells did not participate in the CRS, the town would revert back to a Class 10 and every policyholder would see a 5% increase in their premium.

The City of Lewiston has earned a Class 8 under the CRS by earning more than 1,000 credit points, which translates to a 10% premium savings on every flood insurance policy in Lewiston. As of 07/23/07, there are 39 flood insurance policies in force in Lewiston and the total premium savings due to the CRS credit is approximately \$2,800! The average flood insurance policy holder in the floodplain in Lewiston saves approximately \$109 on their annual premium which would cost about \$981 annually without the city's CRS credit. If Lewiston did not participate in the CRS, the town would revert back to a Class 10 and every policyholder would see a 10% increase in their premium.

If you would like to know more about the CRS, please refer to Chapter 7.



# Federal Emergency Management Agency

Region I

J.W. McCormack Post Office &  
Courthouse Building, Room 442  
Boston, MA 02109

## Effects of Suspension from the National Flood Insurance Program

**Should a community be suspended from the National Flood Insurance Program (NFIP) the effects are severe. For your information, we have outlined the effects below:**

A. The first and foremost consequence is that no new flood insurance policies can be sold within the community and existing policies will expire as they come up for renewal. This is particularly important in view of recent legislation amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) which became effective on May 22, 1989.

Prior to the Stafford Act state and local governments, and certain private non-profit organizations eligible for disaster assistance, have not been penalized for failing to insure their flood prone facilities prior to a major flood disaster. This means that a building and its contents located in a special flood hazard area must be protected by the maximum amount available under the NFIP's standard flood insurance policy in order to qualify for full disaster assistance.

B. The sanctions of the Flood Disaster Protection Act of 1973, as amended, will be imposed. Thus, all forms of direct federal financial assistance for acquisition or construction in the special flood hazard area will cease to be available. This includes:

1. Federal Disaster relief for flooded buildings and their contents, as explained in A. above.
2. All federal grants from such agencies as:  
Environmental Protection Agency, Department of Commerce, Department of Housing and Urban Development, and the Small Business Administration, to name a few.
3. All federally insured or guaranteed loans, such as:  
SBA, FHA, VA, and Farmer's Home. In addition, banks must notify new or renewal mortgages in flood hazard areas that federal disaster assistance would be restricted for their properties in the event of a flood.

C. Although lending institutions are not prohibited from making conventional mortgages for acquisition or construction purposes within the special flood hazard area of a suspended community; they may be reluctant to issue mortgages on properties without flood insurance protection and to take on the responsibility of a mortgage that cannot be resold on the secondary market to any federal or quasi-federal instrumentality.

D. In communities without a sound floodplain management program, substantially improved or new structures which are allowed to be built with the lowest floor (including basement) below the 100-year flood elevation will have at least a one in four chance of being flooded during the next 30 years. Those built significantly below the 100-year level will have an even higher chance of being flooded. In addition to the increased risk of flood damage, the insurance premiums for structures built this way is based on the actuarial rate rather than the subsidized rate. Actuarial rates can be as high as 25 dollars per 100 dollars of insurance coverage. This could mean that in the next flood, many people who were allowed to build unsafely in the special flood hazard area may suffer an uninsured loss.

It is conceivable local governments may be held liable, because their actions deny the ability of its citizens to purchase flood insurance and does not take positive steps to reduce the exposure of life and property in the face of authoritative scientific and technical data.

In view of all this, it is quite safe to say that a significant economic and social dislocation would take place should a community choose to cease participation in the Flood Insurance Program.

The regulations which a community is being asked to adopt and enforce are really basic common sense. We have scientifically calculated the probable levels of the flood that has a one-percent chance of annual occurrence (100-year Flood). The floodplain management regulations which we require simply attempt to reduce the flood risk through proper and safe construction.

Further information and assistance is available from our office at the above address or call us at (617) 223-9561.

**Protecting your property from flooding: Anchoring Heating Oil/Propane  
Tanks (FEMA 481- DVD Video)**

# Anchoring Home Fuel Tanks

A Presentation of FEMA's Mitigation Division



# FEMA

FEMA 481



# Protecting Your Property From Flooding



## FEMA

### Are You at Risk?

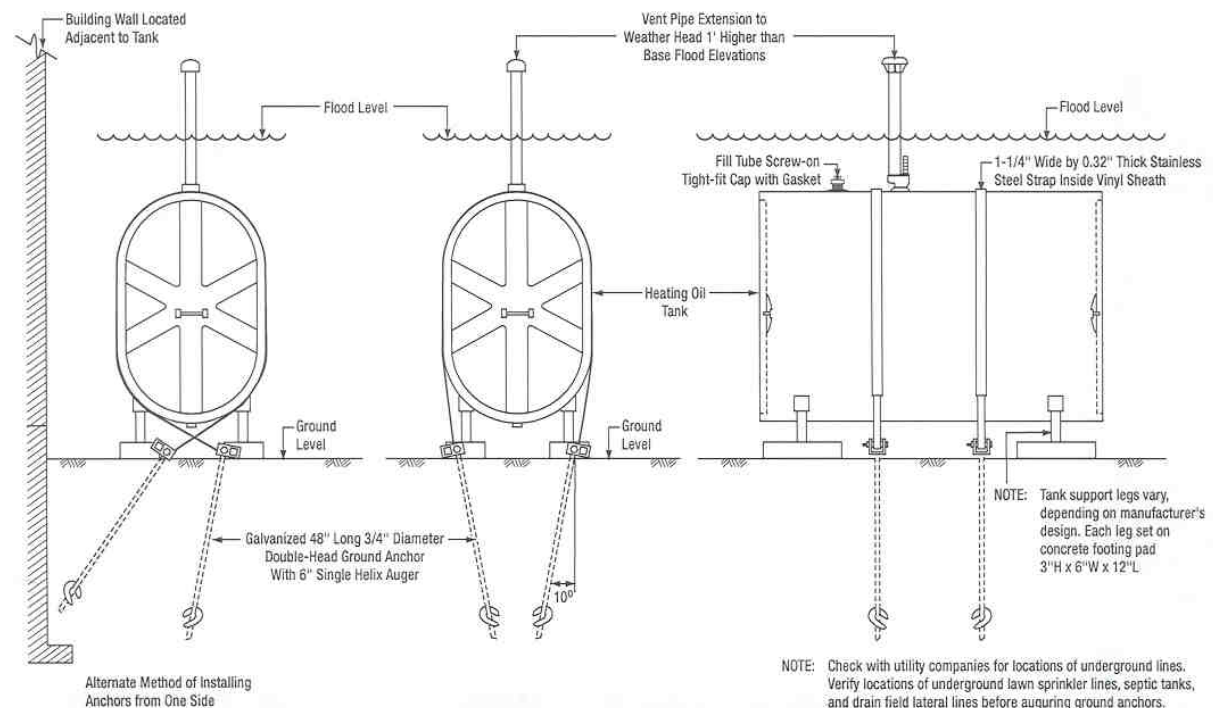
If you aren't sure whether your house is at risk from flooding, check with your local floodplain manager, building official, city engineer, or planning and zoning administrator. They can tell you whether you are in a flood hazard area. Also, they usually can tell you how to protect yourself and your house and property from flooding.

### What You Can Do

Flood protection can involve a variety of changes to your house and property – changes that can vary in complexity and cost. You may be able to make some types of changes yourself; however, complicated or large-scale changes and those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city. One example of flood protection is anchoring fuel tanks. This is something that skilled homeowners can probably do on their own.

### Anchor Outside Heating Oil Tanks

Unanchored heating oil tanks can be easily moved by flood waters. These tanks pose serious threats not only to you, your family, and your house, but also to public safety and the environment. An unanchored tank outside your house can be driven into your walls by flood waters, and it can be swept downstream, where it can damage other houses. As shown in the figure, one way to anchor an outside fuel tank is to secure it by running straps over it and attaching them to ground anchors. The ground anchors and straps described below are the same products that are required by building codes to tie-down mobile homes. These products are available from suppliers and installers that service the manufactured housing industry.



# Protecting Your Property From Flooding



## FEMA

### Are You at Risk?

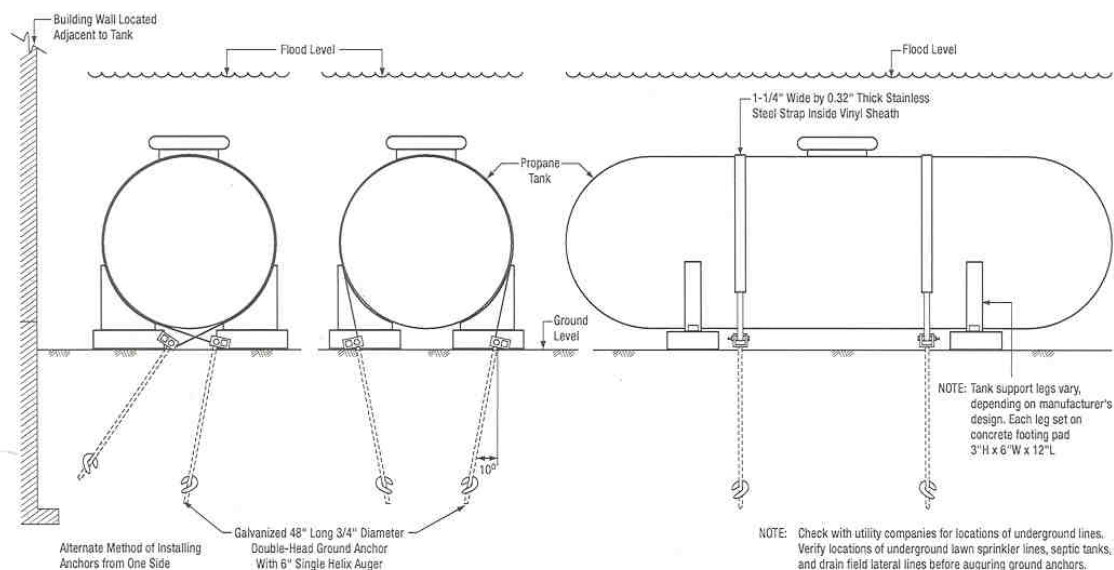
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### What You Can Do

Flood protection can involve a variety of changes to your house and property – changes that can vary in complexity and cost. You may be able to make some types of changes yourself; however, complicated or large-scale changes and those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city. One example of flood protection is anchoring propane tanks. This is something that skilled homeowners can probably do on their own.

### Anchor Outside Propane Tanks

Unanchored propane tanks can be easily moved by flood waters. These tanks pose serious threats not only to you, your family, and your house, but also to public safety and the environment. Propane is stored in pressurized vessels as liquefied petroleum gas (LPG), which can be extremely volatile and potentially explosive if the tank is ruptured and the escaping LPG is ignited by a spark. An unanchored tank outside your house can be driven into your walls by flood waters, or can be swept downstream, where it can damage other houses. As shown in the figure, an inexpensive way to secure a horizontal outside propane tank is to install four ground anchors connected across the top of the tank with metal straps. Secure vertical tank (120-gallon, 420 lb. size) with two ground anchors. Set each anchor on opposite sides of vertical tank. Attach strap from each anchor to collar secured around top of tank. Attach another metal strap connected from one anchor to the other through tank base. The ground anchors and straps described below are the same products that are required by building codes to tie down mobile homes. These products are available from suppliers and installers that service the manufactured housing industry.



## **Appendix O**

### **Glossary**

## Appendix O – Glossary

**Accessory Structure** - means a small detached structure that is incidental and subordinate to the principal structure. Under the National Flood Insurance Program, accessory structures are defined as appurtenant structures.

**Adjacent Grade** - means the natural elevation of the ground surface prior to construction next to the proposed walls of a structure. (see highest adjacent grade and lowest adjacent grade).

**Anchoring** - Special connections made to ensure that a building will not float off or be pushed off its foundation during a flood. Anchoring requirements for a building are discussed on page 5-5, and for a mobile home are found on page 5-6.

**Appeal** - A request to the Board of Appeals to overrule a permit denial because the applicant claims that the ordinance has been incorrectly interpreted.

**Area of a Shallow Flooding** - means a designated AO or AH zone on a community's Flood Insurance Rate Map (FIRM) with a one percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

**Area of Special Flood Hazard** - see **Special Flood Hazard Area (SFHA)**.

**A Zone** - See **Zone A**.

**Base Flood** - means the flood having a one percent chance of being equaled or exceeded in any given year, commonly called the 100-year flood. See discussion on page 2-5.

**Base Flood Elevation (BFE)** - The elevation of the crest of the base flood or 100-year flood. See discussion on page 2-5.

**Basement** - means any area of the building having its floor subgrade (below ground level) on all sides.

**Best Available Data** - Refers to the best hydraulic and hydrologic data available to show what the 100 year flood elevations and floodplain boundaries are for a particular area. See discussion on page 2-6.

**Biennial Report** - A report submitted to FEMA every other year. It includes questions on the number of permits and variances issued, changes in the community's flood characteristics, changes in the community's corporate limits, etc. See discussion on page 6-4.

**Breakaway Wall** - means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

**Building** - see **Structure**.

**Certificate of Compliance** - A document signed by the Code Enforcement Officer stating that a structure is in compliance with all of the provisions of this Ordinance.

**Coastal Barrier Area (CBRA)** – Part of the Coastal Barrier Resource System established under the Coastal Barrier Resources Act 1982. CBRAs are naturally occurring islands, sandbars, or other strips of land, including coastal mainland, that protect the coast from severe wave wash that has been identified by the Department of the Interior (DOI).

**Code Enforcement Officer (CEO)** - A person certified under Title 30-A MRSA, Section 4451 (including exceptions in subsection 4451, paragraph 1) and employed by a municipality to enforce all applicable comprehensive planning and land use laws and ordinances. See discussion on page 6-1.

**Code of Federal Regulations (CFR)** - A master coding system to identify the federal agency regulations that have been published in the Federal Register. 44 CFR includes all the regulations published by the Federal Emergency Management Agency.

**Conditional Use** - means a use that because of its potential impact on surrounding areas and structures, is permitted only upon review and approval by the Planning Board pursuant to Article VII of the Model Floodplain Management Ordinance.

**Critical Facilities** - Facilities for which even a slight chance of flooding is too great. They include facilities that involve storage of highly volatile, flammable, explosive, toxic or water reactive materials, hospitals, nursing homes and housing for the elderly, emergency operation centers or data storage centers, generating plants and substations.

**Cross Section** - Survey information that records the dimensions of a valley at right angles to the flow of a flood. A cross section is used to calculate how much volume or room is available to carry the flood discharge.

**Datum** - A point of reference used to insure that all horizontal or elevation records are properly related. For floodplain management vertical measurement purposes see definition of National Geodetic Vertical Datum (NGVD) of 1929 and North American Vertical Datum (NAVD) of 1988.

**Development** - means any man made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations or storage of equipment or materials.

**Discharge** - The amount of water that passes a point. Discharge is usually measured in cubic feet per second. For flood insurance studies the peak flood discharge is the greatest amount of water that will pass a point at the crest of the flood.

**Elevated Building** - means a non-basement building

- a. built, in the case of a building in Zones A1-30, AE, A, AO, or AH, to have the top of the elevated floor, or in the case of a building in Zones V1-30 or VE, to have the bottom of the lowest horizontal structural member of the elevated floor, elevated above the ground level by means of pilings, columns, post, piers, or "stilts;" and,
- b. adequately anchored so as not to impair the structural integrity of the building during a flood of up to one foot above the magnitude of the base flood.

In the case of Zones A1-30, AE, A, or AO, **Elevated Building** also includes a building elevated by means of fill or solid foundation perimeter walls with hydraulic openings sufficient to facilitate the unimpeded movement of flood waters, as required in Article VI.L. In the case of Zones V1-30 or VE, **Elevated Building** also includes a building otherwise meeting the definition of elevated building, even though the lower area is enclosed by means of breakaway walls, if the breakaway walls meet the standards of Article VI.P.2.b.(3) of the Model Floodplain Management Ordinance.

**Elevation Certificate** - An official form (FEMA Form 81-31, 02/06, as amended) that:

- a. is used to verify compliance with the floodplain management regulations of the National Flood Insurance Program; and,
- b. is often required for purchasing flood insurance.

See discussion on page 6-4 and a sample in Appendix D.

**Equal Degree of Encroachment Rule** - A legal rule used in floodway studies. By following this rule property owners on both sides of a stream are treated the same.

**Federal Emergency Management Agency (FEMA)** - FEMA is the federal agency under the Department of Homeland Security (DHS) which administers the National Flood Insurance Program (NFIP).

**Federal Insurance Administration (FIA)** - The FIA is the part of FEMA which is responsible for the National Flood Insurance Program (NFIP). This acronym also references the Federal Insurance Administrator depending upon the context in which the acronym is used.

**Federal Register** - A daily publication of the federal government used to publicize federal agencies' rules.

**Flood** or **Flooding** - means:

- a. A general and temporary condition of partial or complete inundation of normally dry land areas from:
  1. The overflow of inland or tidal waters.
  2. The unusual and rapid accumulation or runoff of surface waters from any source.
- b. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (a)(1) of this definition.

**Flood Elevation Study** - see **Flood Insurance Study**.

**Flood Hazard Boundary Map (FHBM)** - The National Flood Insurance Program (NFIP) map produced for communities that are not in the Regular Phase of the NFIP. This is the generally the first floodplain map a community receives from the Federal Insurance Administrator. It is similar to an approximate Flood Insurance Rate Map (FIRM). Eventually all FHBMs will be replaced by FIRMs.

**Flood Insurance Rate Map (FIRM)** - means an official map of a community, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

**Flood Insurance Study** - means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.

**Floodplain or Flood-prone Area** - means any land area susceptible to being inundated by water from any source (see **Flood or Flooding**).

**Floodplain Management** - means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations.

**Floodplain Management Regulations** - means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain Ordinance, grading ordinance, and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

**Floodproofing** - means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and contents. Dry floodproofing consists of ensuring that the walls and floor are watertight and capable of withstanding buoyancy, hydrostatic pressures and hydrodynamic forces. Wet floodproofing permits water to enter the building and seek its own level to alleviate hydrostatic pressure but cause minimal damage to the structure.

**Flood Protection Elevation (FPE)** - The elevation to which a structure must be protected from flood damage through elevation or floodproofing. The FPE is usually the 100 year flood elevation plus a certain number of feet, known as freeboard.

**Flood Fringe** - The part of the floodplain outside the floodway.

**Floodway** - see **Regulatory Floodway**.

**Floodway Data Table** - The table provided in the Flood Insurance Study (FIS) which provides detailed information for each cross section on streams studied in detail.

**Floodway Encroachment Lines** - mean the lines marking the limits of floodways on federal, state, and local floodplain maps.

**404 Permit** - A permit required by Section 404 of the Clean Water Act to protect rivers and adjacent wetlands from being filled. This permit program is administered by the U.S. Army Corps of Engineers.

**Freeboard** - means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. Freeboard tends to compensate for the many unknown factors, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed, that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions. The base flood elevation plus the freeboard equals the Flood Protection Elevation (FPE).

**Functionally Dependent Use** - means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

**Hardship** - Impositions upon a property from an ordinance which:

- a. result in no economic use of the property;
- b. are unique to that property and not common to the neighborhood; and
- c. are not the result of actions of the owner or previous owner.

**Highest Adjacent Grade (HAG)** means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

**Historic Structure** - means any structure that is:

- a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district;
- c. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
- d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
  1. By an approved state program as determined by the Secretary of the Interior, or
  2. Directly by the Secretary of the Interior in states without approved programs.

**Hydraulics** - The study of moving water. The hydraulic analysis in a Flood Insurance Study (FIS) calculates how high and how fast a flood discharge flows.

**Hydrodynamic Forces** - The forces on a building of moving water from current, waves, flooding debris, ice etc.

**Hydrology** - The science dealing with the water of the earth. A hydrologic study produces an estimate of the flood discharge.

**Hydrostatic Pressure** - The pressure standing water places on the walls and floor of a building. Hydrostatic pressure of 3 to 4 feet of standing water can collapse walls or buckle basement floors.

**Letter of Map Amendment (LOMA)** - A correction to data existing on a current Flood Insurance Rate Map (FIRM). FEMA will issue a LOMA for a building that has been constructed with its lowest adjacent grade at or above the 100 year flood elevation, thereby waiving the mandatory flood insurance purchase requirements of most lending institutions.

**Locally Established Datum** - means, for purposes of this ordinance, an elevation established for a specific site to which all other elevations at the site are referenced. This elevation is generally not referenced to the National Geodetic Vertical Datum (NGVD) or any other established datum and is used in areas where Mean Sea Level data is too far from a specific site to be practically used.

**Lowest Adjacent Grade** means the lowest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

**Lowest Floor** - means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements described in Article VI of the Model Floodplain Management Ordinance.

**Maine Revised Statutes Annotated (MRSA)** - The laws of the State of Maine which also provide legal framework for the floodplain regulations in Maine.

**Manufactured Home** - means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes the term manufactured home also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days.

**Manufactured Home Park or Subdivision** - means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

**Mean Sea Level** - means, for purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD 1988) other datum, to which base flood elevations shown on a community's Flood Insurance Rate map are referenced.

**Minor Development** - means all development that is not new construction or a substantial improvement, such as repairs, maintenance, or renovations, or additions, whose value is less than 50% of the market value of the structure. It also includes, but is not limited to: accessory structures as provided for in Article VI.J. (of the Model Floodplain Management Ordinance), mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, deposition or extraction of materials, public or private sewage disposal systems or water supply facilities that do not involve structures; Minor development includes non-structural projects such as bridges, dams, towers, fencing, pipelines, wharves, and piers.

**National Flood Insurance Program (NFIP)** - the federal program which makes federally backed flood insurance available to property owners in communities which agree to adopt and enforce an ordinance regulating new development in floodprone areas. The community's regulations must meet minimum federal and state criteria for development in floodprone.

**National Geodetic Vertical Datum (NGVD)** - the national vertical datum, whose standard was established in 1929, and was used by the National Flood Insurance Program (NFIP) as the vertical control for its mapping from the Nil's inception in 1968 until approximately 2006 in Maine. NGVD is based upon mean sea level and also has been called "1929 Mean Sea Level (MSL)".

**New Construction** - means structures for which the "start of construction" commenced on or after the effective date of the initial floodplain management regulations adopted by a community and includes any subsequent improvements to such structures.

**North American Vertical Datum (NAVD)** the national datum, whose standard was established in 1988, which is the new vertical datum used by the National Flood Insurance Program (NFIP) for all new Flood Insurance Rate Maps being developed under the mapping update program known as Map Modernization. NAVD is based upon Vertical datum used by other North American countries such as Canada and Mexico and was established to replace NGVD because of constant movement of the earth's crust, glacial rebound, and subsidence and the increasing use of satellite technology.

**One Hundred Year Flood** - see **Base Flood**. Often referred to as the regulatory flood.

**Ponding** - A flooding condition caused when rain runoff drains to a location that has no ready outlet. Ponding water usually stands until it is able to seep into the ground. Ponding is a common problem in leveed areas, flat areas, and in communities where construction of streets and other development has blocked the natural outlets.

**Post-FIRM Construction** - construction or substantial improvement that started on or after the effective date of the initial Flood Insurance Rate Map (FIRM) of the community **or** after December 31, 1974, whichever is later.

**Pre-FIRM** - construction or substantial improvement that started on or before December 31, 1974, **or** before the effective date of the initial Flood Insurance Rate Map (FIRM) of the community, whichever is later.

**Profile** - A graph showing the side view of a flood. The profile delineates the elevation of a flood at any particular location along the stream. Profiles usually depict a specific reach of a waterbody such as the distance between two cross sections.

**"Q"** - An abbreviation used by engineers to stand for discharge.

**Recreational Vehicle** - means a vehicle which is:

- a. built on a single chassis;
- b. 400 square feet or less when measured at the largest horizontal projection, not including slideouts;
- c. designed to be self-propelled or permanently towable by a motor vehicle;
- d. and designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

**Registered Professional Engineer** - An engineer who has been tested and registered by the Maine Department of Professional and Financial Regulation. A graduate of an engineering school does not become a registered professional engineer until he has so many years of experience and passes the Department's test.

**Regulatory Floodway** –

- a. means the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot, and
- b. when not designated on the community's Flood Insurance Rate Map or Flood Boundary and Floodway Map, it is considered to be the channel of a river or other water course and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.

Regulations require that the floodway be kept open so that the floods can proceed downstream and not be obstructed or diverted onto other properties.

**Riverine** - means relating to, formed by, or resembling a river (including tributaries), stream, brook, etc. Riverine floodplains have readily identifiable channels that are regulated differently from floodplains caused by ponding, sheet flow or coastal flooding.

**Roughness** - A factor incorporated into Flood Insurance Studies (FIS) to account for surface conditions that affect flood flow. A streambed with a sandy bottom will have a different roughness coefficient than a stream with large boulders as the streambed.

**Section 1316** - A section in the National Flood Insurance Act of 1968 which authorizes local officials to request that the Federal Insurance Administration (FIA) deny flood insurance coverage on a building built in violation of a local ordinance. See discussion on page 6-16.

**Special Flood Hazard Area (SFHA)** - means the land in the floodplain having a one percent or greater chance of flooding in any given year, as specifically identified in the Flood Insurance Study cited in Article I of the Model Floodplain Management Ordinance.

**Start of Construction** – (for other than new construction or substantial improvement under the Coastal Barrier Resources Act (Pub. L. 97-348)), includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, or modification of any construction element, whether or not that alteration affects the external dimensions of the building.

**Structure** - means, for floodplain management purposes, a walled and roofed building. A gas or liquid storage tank that is principally above ground is also a structure.

**State Coordinating Agency** means the agency of the state government, or other office designated by the Governor of the state or by state statute at the request of the Administrator to assist in the implementation of the National Flood Insurance Program. In the State of Maine the coordination Agency is the State Planning Office.

**Substantial Damage** - means, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damage condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

**Substantial Improvement** - means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. This term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:

- a. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
- b. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure, and a variance is obtained from the Board of Appeals.

**Topographic Map** - A map showing the elevation contour lines.

**Uplift** - Hydrostatic pressure placed on a floor as water below the floor tries to seek its own level.

**Use Permit** - A permit issued after a development project is complete and the property has passed all the necessary inspections. Depending on the local ordinance provisions, a building cannot be occupied nor can a site be used unless a use permit or a certificate of use and occupancy is issued by the building official.

**Variance** - means a grant of relief by a community from the terms of a floodplain management regulation.

**Violation** - means the failure of a structure or development to comply with a community's floodplain management regulations.

**Zone A** - A Special Flood Hazard Area (SFHA) shown on the National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs). There are five types of A Zones:

A: SFHA where no base flood elevation data is provided.

AE: SFHA where base flood elevations are provided.

A1-30: Numbered A Zone (e.g., A7 or A14), riverine SFHA where a Flood Insurance Study (FIS) provided base flood elevations. This is an old flood hazard designation no longer used in FIRMs but is still valid for those FIRMs that have not been superseded.

AH: SFHA with sheet flow or shallow flooding, base flood elevations are provided.

AO: SFHA with sheet flow or shallow flooding, base flood depths (feet above grade) are provided.

**Zone B** - On Flood Insurance Rate Maps (FIRMs), the area depicted as between the limits of the 100-year and 500-year floods. B Zones are also used to designate 100-year floodplains of little hazard, such as those with average depths of less than one foot. This is an old flood hazard designation no longer used in FIRMs but is still valid for those FIRMs that have not been superseded. New identified areas meeting this description are now Zone X (shaded).

**Zone C** - An area shown on the National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs) as being above the 500-year flood levels.

**Zone V** - A Special Flood Hazard Area (SFHA) in coastal communities shown on the National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs). Zone V (for velocity) is characterized as having coastal wave action of three feet or greater in height. There are two types of V zones on Maine community FIRMs:

V1-30: Numbered V Zone (e.g., V7 or V14), older coastal SFHA where a Flood Insurance Study (FIS) provided base flood elevations and where significant wave action is present during a 1% flooding event. This is an old flood hazard designation no longer used in FIRMs but is still valid for those FIRMs that have not been superseded.

VE: Coastal SFHA where base flood elevations are provided and significant wave action is present during a 1% flooding event .

**Zone X** - An area shown on the National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs) as being above the 500-year flood levels.

**Zone X (shaded)** - On Flood Insurance Rate Maps (FIRMs), the area depicted as between the limits of the 100-year and 500-year floods. X Zones are also used to designate 100-year floodplains of little hazard, such as those with average depths of less than one foot.



**Victim of Patriot's Day Flood April 2007, Kennebunk, Maine**