

An aerial photograph showing a wide, muddy brown river flowing through a lush green forest. A small boat is visible in the middle of the river, and several power lines run parallel to the water's edge. The water appears to be overflowing its banks in some areas, inundating the surrounding land.

# Management of Floodplain Development

Floodwaters of the Schoharie Creek inundate area homes and roads. Source: Tim Hogan

Rossana Rosado, Secretary of State

Andrew M. Cuomo, Governor



Department  
of State



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The New York State Department of State (DOS) has prepared a collection of model local laws, in consultation with the New York State Department of Environmental Conservation (NYSDEC) and other stakeholders, that include consideration of future risk due to sea-level rise, storm surge and/or flooding as a result of climate change as required in the New York State Community Risk and Resiliency Act of 2014.

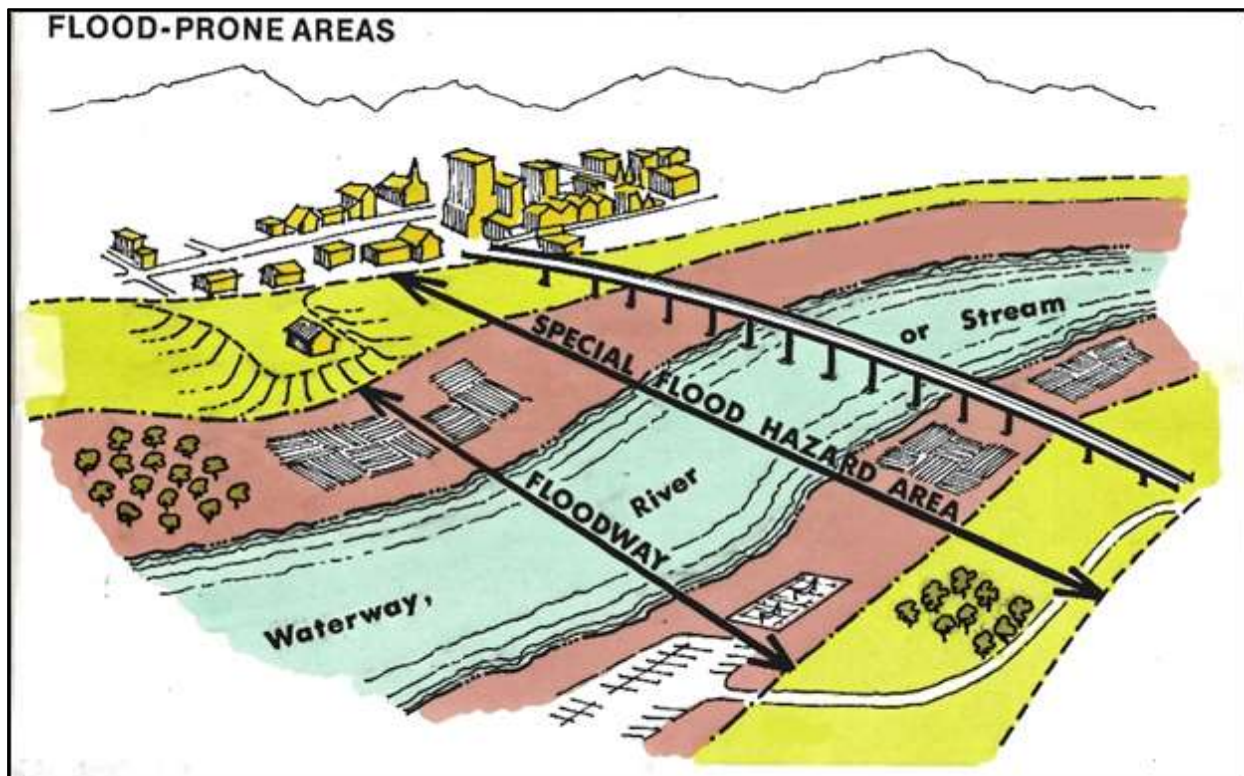
Municipal adoption of model local laws is intended to help local governments and their communities increase resiliency. This publication does not establish any legally binding standards or required criteria for state or municipal government to follow. Use of this guidance by a municipality is not a substitute for consultation with an attorney working on behalf of the municipality and municipal officials should consult with an attorney prior to adoption of any local law.

## 4. Management of Floodplain Development

When floodplains are altered, the ability of floodplains to absorb floodwaters and reduce risk from a flood is diminished. Development within a floodplain can make flooding and flood damage more severe and extensive. The most common flood damages arise from:

- Direct damage during a flood from inundation, high velocity flow, waves, erosion, sedimentation and/or flood-borne debris;
- Degradation of building materials, either during the flood or sometime after the flood; and
- Contamination of buildings due to flood-borne substances or mold.

Climate change in New York is expected to increase the extent of flooding in the state. Precipitation intensity, the amount of rainfall that occurs in a single event, is projected to increase everywhere as temperatures increase. Short, intense precipitation events can exceed the ability of rainwater to infiltrate into the ground, which can dramatically increase runoff and the potential for flooding.<sup>1</sup> Sea level rise is increasing storm surge elevations from coastal storms and threatening some low-lying areas with gradual inundation, and climate change may increase the severity of tropical storms and hurricanes.



Establishing development setbacks that reduce encroachment into floodplains and leaving floodplains as open space will increase municipal resilience to floods and minimize damage

from future flooding, particularly within the areas where streams and rivers naturally meander and shorelines adjust to tides, currents, storms and rising sea level.

Nearly all municipalities in New York have flood damage prevention laws<sup>2</sup>, which are a critical component of reducing municipal risk from damaging floods, and a critical requirement that must be met to qualify municipalities for the National Flood Insurance Program (NFIP). Such laws create minimum standards for resilient development in Federal Emergency Management Agency (FEMA) mapped special flood hazard areas and qualify municipalities for participation in the NFIP. NFIP participation is required by federal law to allow federally backed flood insurance to be sold within the municipality and is required for the municipality to be eligible for federal disaster assistance for structures in mapped floodplains. If the development standards are enforced, flood damages due to inundation are reduced. However, flood damage prevention laws do not typically limit density or use of land in floodplains, prevent floodwater conveyance areas from being reduced, prevent valley storage from being filled, or consider increased flood risk due to development, sea level rise, or increased precipitation due to climate change.

Laws that govern the use, siting, design, construction, and maintenance practices in floodplain areas can complement flood damage prevention laws and help minimize the likelihood and impacts of flood damages.

Municipalities are encouraged to consider incorporating the “No Adverse Impact” principle into their local laws and project reviews. Developed by the Association of State Floodplain Managers (ASFPM), the approach ensures that actions of a municipality or property owner will not adversely impact the property and rights of others. A municipality can follow that principle by making sure that the actions taken in its floodplain, and throughout its part of the watershed, do not lead to adverse impacts on other property.<sup>3</sup> If adverse impacts would occur, the impacts should be mitigated to prevent transferring problems to another property or municipality.

To incorporate the “No Adverse Impact” concept, a municipality should:

- Decide what an “adverse impact” is in the municipality. Adverse-impact concerns should be based on the municipality’s physical, environmental, social and economic condition and incorporated into plans and policies. For example, it could be impacts on water quality, increase in debris and sediment blockage, or coastal erosion.
- Evaluate its hazards and programs, with the goal of lessening the impacts of actions on other property owners and communities.;
- Identify existing adverse impacts in the floodplain and throughout the watershed.
- Use its resources to reduce or eliminate existing adverse impacts.

Municipal floodplain laws may require a higher standard than state and federal (FEMA) regulations, but even under the “No Adverse Impact” concept they may not require less than state and federal regulations in order to participate in the National Flood Insurance Program. For example, they may require higher flood protection elevations, limit use and density in floodplains, and establish buffer and setback requirements for development adjacent to coasts



and riverine floodplains. Homeowners in municipalities that adopt additional standards and policies and carry out certain activities that reduce flood risk may qualify for reduced flood insurance rates if the municipality participates in the NFIP Community Rating System (CRS). CRS is a FEMA program that provides discounts for communities that take measures that are beyond the minimum requirements of the National Flood Insurance Program (NFIP). CRS participation is only open to individual towns, cities and villages; however, counties, watershed associations, and regional planning agencies can assist with the CRS application process. Examples of counties, watershed associations and regional planning agencies that have assisted individual communities include Delaware and Schoharie counties, the Southern Tier Central Regional Planning and Development Board, and the Ashokan Watershed Stream Management Program.

**The NYS Department of Environmental Conservation (NYSDEC) Bureau of Flood Protection and Dam Safety reviews proposed new or amended floodplain laws to ensure compatibility with the NFIP. Proposals should be sent to:**

NYS Department of Environmental Conservation  
 Division of Water, Bureau of Flood Protection and Dam Safety  
 625 Broadway, 4th Floor  
 Albany, NY 12233-3504.  
[floodplain@dec.ny.gov](mailto:floodplain@dec.ny.gov)

Municipalities in New York State use a variety of local law techniques to manage floodplain development and to limit damage from flooding. The table below summarizes the variety of regulatory techniques that are described in this chapter, as well as other chapters of the Model Local Laws.

Floodplain Management Model Local Laws	
Technique	Description
Floodplain Overlay District	A zoning overlay district that restricts uses in the floodplain.
Floodplain and Wetland Resource Conservation Overlay District	A zoning overlay district to apply performance standards to new development in stream corridors, including floodplains, buffer areas, and regulated wetlands.
Flood Damage Prevention Laws	Local laws that meet or exceed NFIP guidelines that reduce municipal risk from damaging floods.
Examples from other Chapters in the Model Local Laws Publication	
Subdivision in Flood Prone Areas	Prohibit the subdivision of land for residential use if it is subject to flooding and deemed by the Planning Board as uninhabitable. See example in <i>Basic Land Use Tools for Resiliency</i> Chapter.

Protection of Natural Features in a Subdivision	Provisions in local subdivision regulations to protect natural features including floodplains. See example in the <i>Basic Land Use Tools for Resiliency</i> Chapter, such as protection of natural features in a subdivision and cluster or conservation subdivision where floodplains are preserved as open space.
Prohibit Substantial Improvements to Nonconforming Uses or Structures in a Flood Protection District	Would prohibit substantial improvements to nonconforming uses or structures in a flood protection district and require flood insurance for remaining nonconforming structures. See example in the <i>Basic Land Use Tools for Resiliency</i> Chapter.
Transfer of Development Rights	Transfer of Development Rights provides ways to preserve open space to maintain floodplains and retain stormwater. See example in the <i>Basic Land Use Tools for Resiliency</i> Chapter.
Stormwater and Erosion Control Laws	Zoning provisions designed to reduce erosion and runoff from new development. See example in <i>Stormwater Control Measures</i> Chapter.
Watercourse Protection	Watercourse protection measures usually include buffers and development setbacks from streams and rivers. See examples in <i>Wetland and Watercourse Protection Measures</i> Chapter.

## Flood Protection Terminology

**Area of Special Flood Hazard Area:** The land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. This area may be designated as Zone A, AE, AH, AO, A1-A30, A99, V, VO, VE, or V1-V30. It is also commonly referred to as the base floodplain or 100-year floodplain. For purposes of [a flood damage prevention law], the term “special flood hazard area (SFHA)” is synonymous in meaning with the phrase “area of special flood hazard.”<sup>1</sup>

**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. The area is designated on a FIRM as Zone V1-V30, VE, Vo or V.<sup>1</sup>

**Base Flood:** The flood having a 1-percent chance of being equaled or exceeded in any given year.<sup>2</sup>

**Base Flood Elevation (BFE):** The elevation of the base flood, including wave height, relative to the National Geodetic Vertical Datum (NGVD), North American Vertical Datum (NAVD) or other datum specified on the Flood Insurance Rate Map (FIRM).<sup>2</sup>

**Design Flood:** The flood associated with the greater of the following two areas:

1. Area with a flood plain subject to a 1-percent or greater chance of flooding in any year.
2. Area designated as a flood hazard area on a community’s flood hazard map, or otherwise legally designated.<sup>2</sup>

**Design Flood Elevation (DFE):** The elevation of the “design flood,” including wave height, relative to the datum specified on the community’s legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation shall be the elevation of the highest existing grade of the building’s perimeter plus the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 2 feet (610 mm).<sup>2</sup>

**Development:** Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, paving, excavation or drilling operations or storage of equipment or materials.<sup>1</sup>

### Source of Definition

<sup>1</sup> NYSDEC Model Local Law for Flood Damage Prevention

<sup>2</sup> 2015 International Building Code (3<sup>rd</sup> Printing as adopted by New York State)



## **Flood Protection Terminology (Continued)**

**Flood or Flooding:** 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.<sup>2, 1</sup>

"Flood" or "flooding" also means 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 a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in (1) above.<sup>1</sup>

**Flood Insurance Rate Map (FIRM):** An official map of a community, on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community.<sup>2</sup>

**Floodplain or Flood-prone Area:** Any land area susceptible to being inundated by water from any source (see definition of "Flooding").<sup>1</sup>

**Floodway or Regulatory Floodway:** The channel of a river or other watercourse 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 as determined by the Federal Emergency Management Agency in a Flood Insurance Study or by other agencies as provided in Section 4.4-2 of [the flood damage prevention] Law.<sup>1</sup>

Editor's Note: In New York, the height is 0.00 feet, i.e., no measurable rise.

**Freeboard:** A factor of safety expressed in feet (mm) above the design flood elevation.<sup>3</sup>

**Uniform Code:** An abbreviated reference to the NYS Uniform Fire Prevention and Building Code.

### Source of Definition

<sup>1</sup> NYSDEC Model Local Law for Flood Damage Prevention

<sup>2</sup> 2015 International Building Code (3<sup>rd</sup> Printing as adopted by New York State)

<sup>3</sup> Uniform Code

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## RESOURCES

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Kusler, Jon. (2003). *Common Legal Questions about Floodplain Regulations in the Courts, 2003 Update*.<sup>4</sup>

Chapter 4 Regulatory Tools. In *Reducing Damage from Localized Flooding: A Guide for Communities*. (2011). FEMA 511-05<sup>5</sup>

*No Adverse Impact: A Toolkit for Common Sense Floodplain Management*. (2003). Association of State Floodplain Managers. <sup>6</sup>

*National Flood Insurance Program Community Rating System Coordinator's Manual*. (2017). FEMA FIA-15.<sup>7</sup>

The Southern Tier Central Regional Planning and Development Board provides several fact sheets related to floodplain management, as well as floodplain management forms.<sup>8</sup>

New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act<sup>9</sup>

*National Flood Insurance Program Community Rating System CRS Credit for Higher Regulatory Standards*. (2006). FEMA. <sup>10</sup>

## 4.1 Limit Development in 100-Year or 500-Year Floodplain

A municipality may choose to limit development in a flood hazard area through zoning restrictions. One method is to create overlay districts that are contiguous with the FEMA mapped Special Flood Hazard Area within the municipality. To provide more protection, the municipality could define the boundary as the 500-year floodplain (0.2 percent or greater annual chance of flood).

For example, the Land Conservation District in the City of Utica (NY) is defined by the boundary of the 100-year floodplain and floodway.<sup>11</sup> However, land outside the floodplain and floodway are not necessarily free from flood risk. Utica includes a disclaimer that the designation of the district does not imply that land outside of it will be free from flooding.

The provisions of a municipal flood damage prevention law could be incorporated into the floodplain overlay district or incorporated by reference to its place in the municipal code book. A key element of the overlay district is the list of allowed and restricted uses.

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### USAGE

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Incorporate into the regulations and standards section of the municipal zoning law and amend the district use regulations.

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### ADAPTED FROM THE FOLLOWING SOURCE

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Town of Dover (NY) Municipal Code, Chapter 145: Zoning, Article IV: Overlay District Regulations, Section 145-13 Floodplain Overlay District<sup>12</sup>

Town of Ancram (NY) Zoning Law, Article V Supplemental Regulations, A. Regulations for All Districts, 12. Flood Prevention<sup>13</sup>

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### LANGUAGE

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Section X. Floodplain Overlay District.

A. General. The provisions of [*insert chapter number for the Flood Damage Prevention law*] are incorporated herein by reference and shall apply in addition to any other applicable zoning or building regulations.

B. Boundaries. The Floodplain Overlay District shall be the [*one-hundred-year/five-hundred-year*] floodplain, as defined in [*insert section number containing zoning definition of floodplain*]. The boundaries shown on the Overlay District Map are approximate.

C. Prohibited activities. The following uses are prohibited within the Floodplain Overlay District:

- (1) New structures intended for human habitation;
- (2) Dry cleaners;
- (3) New septic tanks, leach fields, or other sanitary sewage systems;
- (4) Storage of petroleum or chemical products;
- (5) Slaughterhouses;
- (6) Manure storage; and
- (7) Placement of fill.

*[Other uses could be added, such as golf courses or campgrounds, due to safety or their potential for contamination.]*

Such restrictions shall not prevent the replacement of existing facilities.

*[Alternatively, the municipality may wish to restrict repairs to flood-damaged structures.]*

D. Permitted activities subject to planning board review. Applications for uses within the floodplain overlay district that require subdivision review, site plan review, or the granting of a special use permit shall be submitted to the Planning Board for review to assure that approvals for such applications are consistent with the need to minimize flood damage or potential pollution of sensitive groundwater supplies in those locations.

(1) The planning board shall require as a condition of approval that the applicant for a permit related to a business, whose property is located in the floodplain overlay district and also lies partially or completely in an underlying *[insert name of industrial district]*, demonstrate the measures he or she will take to store and protect petroleum and chemical products from exposure to and distribution by floods.

(2) The planning board shall require that all structures, public utilities, and facilities shall be located, elevated and constructed to minimize or eliminate flood damage, and that adequate drainage shall be provided so as to reduce exposure to flood hazards in accordance with the *[City/Town/Village]* Flood Damage Prevention law.

## 4.2 Floodplain and Wetland Resource Conservation Overlay District

New York has seen an increase in the frequency, intensity, and duration of extreme precipitation events and coastal storm flooding. Total annual precipitation amounts in the Northeast have increased by approximately 3.3 inches over the last 100 years, which impacts our rivers, streams, coastlines and lakefronts. In some locations, flooding has approached or exceeded 500-year flood levels.

FEMA provides flood hazard maps that show areas prone to flooding. However, about one-third of flood insurance claims are for properties outside of mapped “special flood hazard areas.”<sup>14</sup> Also, according to staff of the NYSDEC Bureau of Flood Protection and Dam Safety, Flood Insurance Rate Maps (FIRMs) in New York State do not demonstrate the extent of flooding from ice jams or wave run up and wave action along the coasts of the Great Lakes (as of 2018). Damage from flooding can be reduced by land use planning and by building smarter. This approach establishes a conservation buffer zone that includes areas both in and outside of the floodplain. It establishes additional standards for all development in the 100-year FEMA floodplain as well as a 500-ft. buffer zone. (A buffer zone could be greater or less than 500 feet.) The buffer zone would be either adjacent to the floodplain or, where no Special Flood Hazard Area has been mapped, measured from the center line of an adjacent perennial stream.

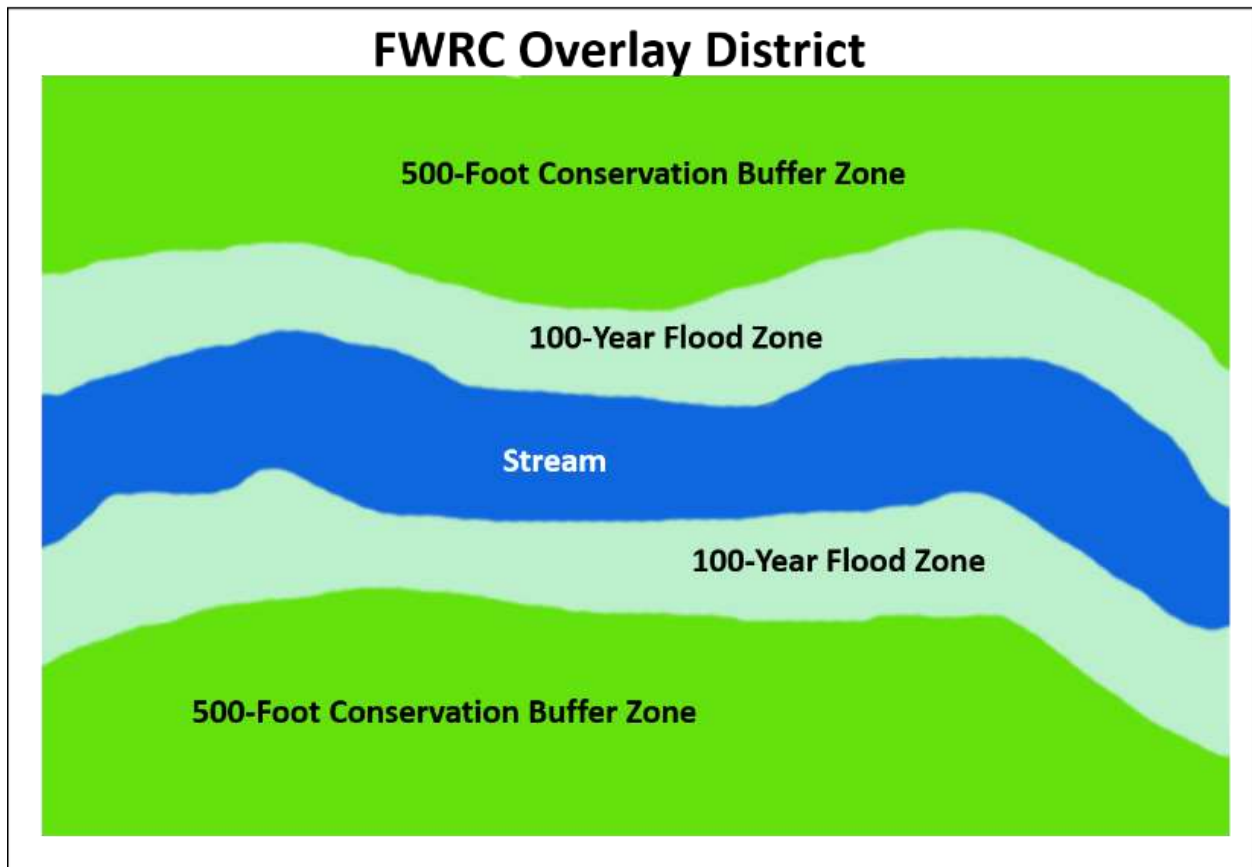
### Floodplain Map Limitations

“The regulatory floodplain on the Flood Insurance Rate Map (FIRM) may not adequately identify all of a community’s at-risk areas. There are several reasons why some local flooding areas may be missing from the community’s FIRM.

- Smaller problem areas do not show up as Special Flood Hazard Areas (SFHAs) because Federal Emergency Management Agency (FEMA) mapping standards focus on larger flood problems, such as watersheds larger than 1 square mile.
- Conditions may have changed since the study was conducted to produce the FIRM, which could be over 10 or 20 years old. [Some New York maps are over 40 years old.]
- When the FIRM was prepared, an area may not have been known to have a flood problem or it may not have had much development activity, so it was not studied.
- The study criteria may not reflect all types of flood-related hazards, including dam or levee failure, stormwater flooding, or land subsidence.”

Source: Chapter 4 Regulatory Tools, from *Reducing Damage from Localized Flooding: A Guide for Communities*. (2005) FEMA. Retrieved 6/12/18 from <https://www.fema.gov/media-library/assets/documents/1012>

The image below illustrates the area that could be included in a floodplain and wetland conservation overlay district.



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#### RESOURCES

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Wagner, K., Neuwirth, J., & Janetschek, H. (2009). *Flood risk – Prevention and Impact on Agricultural Lands. Federal Institute of Agricultural Economics.*<sup>15</sup>

NYS Department of Environmental Conservation. (1986). *Stream Corridor Management: A Basic Reference Manual.*<sup>16</sup>

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#### USAGE

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Identify the area(s) of the municipality that would be included in the overlay district and prepare a map showing those areas as an overlay to the municipal zoning map. Amend the section of the municipal zoning law that establishes zoning districts to include the new overlay district. Add the criteria needed to evaluate applications for special use permits in the description of the overlay district.

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ADAPTED FROM THE FOLLOWING SOURCE

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Town of Greenfield (NY) Municipal Code, Chapter 105 Zoning, Article X Overlay District Requirements, Section 105-112 Floodplain Management, Wetland Resource Conservation Overlay District (FMWRC)<sup>17</sup>

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LANGUAGE

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Section X. Floodplain and Wetland Resource Conservation Overlay District (FWRC)

A. Statement of purpose.

(1) The purpose of the Floodplain and Wetland Resource Conservation Overlay District (FWRC) is to regulate land development within flood hazard zones, wetlands and the *[insert name of specific watershed]*. Population growth, attended by housing, roads and other development, along with increased demands on the *[city/town/village]*'s natural resources, has been found to be encroaching on, despoiling or eliminating many of the *[city/town/village]*'s wetlands, water bodies, watercourses and other natural resources and processes associated therewith.

(2) The conservation, preservation and maintenance of these natural resources in an undisturbed and natural condition constitutes important physical, ecological, social, aesthetic, recreational and economic assets necessary to promote the health, safety and general welfare of present and future residents of the *[city/town/village]* and of downstream drainage areas.

(3) It is the intent of this district to provide for the protection, preservation, proper maintenance and use of the *[city/town/village]*'s water bodies, watercourses and wetlands by preventing or minimizing erosion due to flooding and stormwater runoff, flooding of downstream lands, maintaining the natural groundwater supplies, and preserving and protecting the purity, utility, water-retention capability, ecological functions, recreational usefulness and natural beauty of all water bodies, watercourses and wetlands and other related natural features of the terrain.

(4) Specifically, the following objectives pertain:

(a) To minimize the threat to life and the destruction of property and natural resources from flooding and preserve and/or reestablish natural floodplain hydrologic function.

(b) To maintain, protect and enhance water quality and associated aquatic resources and water supply within the *[mention specific watershed]*.



(c) To enhance the cultural, recreational and visual amenities of the [*insert name of specific stream*] corridor.

(d) To maintain, protect and enhance water quality and associated resources and water supply within the confines of wetlands within the [*city/town/village*].

B. Applicability. In addition to the requirements of [*insert chapter number for the Flood Damage Prevention law*] of the [*City/Town/Village of \_\_\_\_\_*] Code, the following standards for the FWRC Overlay District shall apply to any lands meeting any of the following criteria:

(1) All lands within the 100-year [*alternatively, 500-year*] flood zone as determined by the Federal Emergency Management Agency.

(2) A 500-foot conservation buffer zone adjacent to the 100-year (one percent or greater annual chance) flood zone [*alternatively, the 500-year flood zone or 0.2 percent or greater annual chance*] or, where no flood zone exists, measured from the center line of the stream.

(3) All lands designated as New York State Department of Environmental Conservation regulated wetlands.

(4) All lands designated as federally regulated wetlands by the United States Army Corps of Engineers.

C. Permitted, accessory and special uses. All uses allowed in the underlying zoning district, including permitted uses, accessory uses and special uses, shall be permitted only as a special use in the FWRC Overlay District. Each use shall require a special use permit in compliance with [*insert chapter number for special use permits*]; [*insert chapter number for the Flood Damage Prevention law*]; and the additional standards of this section. Within the 500-foot conservation buffer zone, a special use permit is not required for a minor exterior structural addition or alteration (defined as an enclosed porch, deck, stairway or other similar facility).

D. Space and bulk standards. Any building, structure or use of land within FWRC District shall comply with the space and bulk requirements of the underlying zoning district.

E. Additional standards. Any building, structure or use of land within the FWRC Overlay District shall comply with the following requirements:

(1) No development shall be allowed, other than construction of piers, docks and similar water-dependent uses that have been permitted, providing such uses comply with permitting requirements and the criteria in paragraph (E)(3) below. For the purposes of this section, "Development" means any man-made change to improved or unimproved

real estate, including but not limited to buildings or other structures, mining, dredging, filling, paving, excavation or drilling operations or storage of equipment or materials.

(2) Within the 500-foot conservation buffer zone, no development may take place unless such development is determined by the Planning Board to be in compliance with the following criteria:

(a) That environmental resource constraints are fully considered in establishing land use patterns in the stream corridor.

(b) That open space and visual amenities in rural areas are maintained and preserved by establishing and maintaining greenbelts or vegetated buffer strips along the stream corridor.

(c) That development in the stream corridor is consistent with the historical and cultural character of the surroundings and fully reflects the need to protect visual amenities.

(d) That disturbance of streambeds and streambank erosion are minimized and, where practical, eroding streambanks shall be restored to a natural or stable condition.

(e) That runoff from development areas is controlled such that it does not unnecessarily increase the frequency and intensity of flooding at the risk of threatening life and property.

(f) That the natural vegetative canopy along the stream corridor is maintained or restored to ensure that midsummer stream temperatures do not exceed tolerance limits of desirable aquatic organisms.

(g) That accelerated enrichment of the stream corridor and contamination of waterways from runoff containing nutrients, pathogenic organisms, organic substances and heavy metals and toxic substances are minimized.

(h) Floodplain development criteria for special flood hazard areas.

(i) That base flood elevation data is provided regardless of the proposed development size.

(j) That other data or evidence as may be requested by the Planning Board pertaining to flood and site plan information has been submitted.

F. Performance standards. The following performance standards apply to any land within the 500-foot conservation buffer zone, in addition to the requirements of *[insert reference to zoning article or chapter containing supplementary regulations, and code chapter containing flood damage prevention law]*:

(1) Agriculture.

(a) An untilled filter strip of natural vegetation shall be retained between the tilled ground and the normal high-water mark of the surface waters protected by this district, in accordance with a plan designed after New York State Department of Environmental Conservation guidelines for preventing erosion and sedimentation.

(2) Clearing and noncommercial tree cuttings.

(a) The clearing of trees and conversion to other vegetation is permitted for approved development. Where such clearing extends to the shoreline, a cleared opening(s) not greater than twenty-five feet in width for every one hundred feet of shoreline (measured along the normal high-water mark) may be created. This opening applies to all areas up to fifty feet inland from the normal high-water mark and paralleling the shoreline. Where the natural vegetation is removed, it is to be replaced with other vegetation that is equally effective in retarding erosion and preserving natural beauty. The total width of any opening to the shore shall not exceed forty feet.

(b) Tree cutting for noncommercial purposes is permitted, provided that no more than fifty percent of existing trees six or more inches in diameter, measured at four feet above ground level, are removed from any contiguous stand or grouping of trees. In no case shall the area of contiguous clearing exceed 7,500 square feet.

(3) Erosion and sedimentation control.

(a) On slopes greater than fifteen percent, there shall be no grading or filling within one hundred feet of the normal high-water mark, other than for road construction or water crossings, except to protect the shoreline and prevent erosion.

(b) Development activities shall be conducted in such a manner as to prevent, to the maximum extent possible, erosion and sedimentation loading of surface waters. Such activities shall incorporate the following practices:

[1] As little bare ground as possible shall be exposed and for as short a time as is feasible.

[2] Full use shall be made of temporary ground cover, such as mulch, and permanent cover, such as sod, to stabilize fill and disturbed areas.

[3] Sediment shall be trapped by diversion ditches, silting basins, terraces, siltation fences, and other devices.

[4] The sides of channels or artificial watercourses shall be constructed with side slopes of two units horizontal distance to one unit vertical or flatter, unless bulkheads or riprapping are provided and the sides are stabilized to prevent slumping.

(4) Wetland alteration.

(a) No filling, dredging or other earthmoving shall be carried out within the limits of a wetland as identified by the New York State Department of Environmental Conservation (NYSDEC) except in connection with road construction as set forth under Subsection F of this section.

(b) Within [*insert number such as one hundred*] feet of any NYSDEC-designated wetland, the land shall be maintained in a natural vegetative state and no buildings, structures or impervious surfaces shall be placed or erected.

(c) Pursuant to NYS Environmental Conservation Law, within one hundred feet of a NYSDEC-designated wetland, a NYSDEC permit shall be obtained for the placement of buildings, structures, subsurface drainage or impervious surfaces, prior to their placement or erection.

(5) Roads and water crossings.

(a) All cut or fill banks and areas of exposed mineral soil outside the roadbed within [*insert number such as one hundred*] feet of flowing streams or standing beds of water shall be revegetated or otherwise stabilized so as to reasonably prevent erosion and sedimentation of water bodies. Temporary erosion control measures, including siltation fences or other devices, will be installed where appropriate and/or required by the [*City/Town/Village*] Engineer.

(b) Road banks shall have a slope no greater than two horizontal units to one vertical unit, extending back [*insert number such as one hundred*] feet from the normal high-water mark of flowing streams or standing beds of water.

(c) Drainage ditches are to be provided so as to effectively control water entering and leaving the road area within [*insert number such as one hundred*] feet of the normal high-water mark of flowing streams or standing beds of water. Such drainage ditches will be properly stabilized so that the potential for erosion is minimized.

(d) To prevent road surface drainage from directly entering water bodies, roads and their associated drainage ditches shall be located, constructed and maintained to provide an unscarified filter strip, of at least the width indicated below in Table A, between the road and the normal high-water mark of a surface water body. This requirement does not apply to road approaches to water crossings.

<b>Table A</b>	
<b>Average Slope of Land Between Road and Normal High-Water Mark (percent)</b>	<b>Width of Strip Between Road and Normal High-Water Mark (linear feet along surface of ground)</b>
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

(e) Bridges and culverts shall be installed and maintained in a manner consistent with the New York State Bridge Manual and New York State Department of Environmental Conservation guidelines for stream crossings. In particular, bridges and culverts in tidal areas should be sized to accommodate the higher of the 0.2-percent annual chance flood (Q500) or a range of sea-level rise projections, up to and including the New York State high sea-level rise projection for critical bridges and culverts and the medium projection for non-critical infrastructure. In non-tidal areas, design of bridges and culverts should incorporate the higher of the vertical flood elevation and corresponding horizontal floodplain that result from increasing current, relevant peak flows, e.g., Q50, Q100, to account for projected peak flows for the full, expected service life of the infrastructure, adding freeboard per current applicable engineering requirements or recommendations (three feet preferred), and extending this level to its intersection with the ground, or the vertical flood elevation and corresponding horizontal floodplain subject to flooding from the 0.2-percent annual chance flood (Q500).

(f) Culverts used in water crossings shall be installed at or below streambed elevation, be seated on firm ground, have soil compacted at least halfway up the side of the culvert, be covered by soil to a minimum depth of one foot or according to the culvert manufacturer's specifications, whichever is greater, and have a headwall at the inlet end which is adequately stabilized by riprap or other suitable means to avoid erosion of material around the culvert. These standards do not apply to any water crossing or encroachment regulated by any county, state or federal body.

(6) Subsurface sewage disposal. All subsurface sewage disposal facilities shall be installed in conformance with the New York State Department of Health Standards for Individual Water Supply and Individual Sewage Treatment Systems as well as other appropriate

State of New York and [City/Town/Village of \_\_\_\_\_] regulations. In addition, the following standards apply:

(a) All subsurface sewage disposal systems shall be located in areas of suitable soil and size to meet state standards.

(b) The minimum setback for subsurface sewage disposal facilities with design flows of three hundred gallons per day or less shall be no less than one hundred horizontal feet from the normal high-water mark of the regulated stream(s) or wetland. Systems with design flows of greater than three hundred gallons per day shall have a minimum setback of three hundred horizontal feet.

(7) Timber harvesting. Commercial timber harvesting, other than for road building and water crossings or that is in conjunction with development activities, is prohibited in the FWRC Overlay District.

*A municipality should also consider adding a definition of “Normal High-Water Line” to the definitions section of the zoning law. For example:*

Normal High-Water Line: Means the line on the shore, running parallel to the main stem of the river or stream, established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the immediate bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.<sup>18</sup>

### 4.3 Flood Damage Prevention Laws

The NYS Department of Environmental Conservation (NYSDEC) Bureau of Flood Protection and Dam Safety provides coordination, technical support, and training for floodplain management. To participate in the National Flood Insurance Program (NFIP)<sup>19</sup>, a municipality must adopt and enforce a local flood damage prevention law that is in substantial compliance with the model law provided by the state. Model flood damage prevention laws are provided to guide communities in adopting local laws that meet NFIP requirements. The NYSDEC Bureau of Flood Protection and Dam Safety provides such model laws to communities upon request.

NYSDEC Bureau of Flood Protection and Dam Safety reviews proposed new or amended floodplain laws submitted by municipalities seeking to adopt or amend local flood damage prevention laws to ensure they comply with FEMA and state minimum requirements.

FEMA has calculated that buildings built to the standards reflected in the model local laws suffer 70 percent less flood related damage than unprotected buildings during occurrence of the base flood (i.e., one percent annual chance floor or 100-year flood). However, they can still suffer damage, so higher protection levels are warranted in most instances. For example, floods can be higher than the base flood elevation (BFE) for various reasons, including larger storms, downstream obstructions, increased watershed development, floodplain development, and sea level rise.

Municipalities may opt to tailor their flood damage prevention laws to address additional areas of concern. The model local laws below are optional language that can be “plugged into” the model flood damage prevention law to lower flood risk. Many of the optional techniques may result in lower flood insurance premiums either directly or through the Community Rating System (CRS). CRS is a FEMA program that provides discounts for communities that take measures that are beyond the minimum requirements of the NFIP. Flood insurance policies for structures within communities with over 500 CRS points receive a five percent discount on each insurance policy premium, and additional discounts for a lower CRS class that is achieved in part through accumulation of CRS points. Model local laws provided in other Model Local Law chapters, such as waterway buffers and cluster or open space subdivisions, may also result in CRS points if adopted.

Several methods of increasing protection from flooding are provided. If a municipality decides to use any of these measures, those changes should be brought to the attention of NYSDEC Bureau of Flood Protection and Dam Safety so that staff may review the final language and assure that it is compliant with the NFIP and FEMA regulations.

A municipality that seeks to increase its flood protection by adopting more restrictive standards than the Uniform Code, such as a higher freeboard, is required to contact the New York State Division of Building Standards and Codes for assistance. Local laws adopted outside New York City that are more restrictive than the Uniform Code must receive State Fire Prevention and



Building Code Council approval. The Department of State provides documents on its website relating to more restrictive standards for construction, including a “Code Outreach Program - More Restrictive Construction Standards” and a form called “Notice and Petition Relating to More Restrictive Construction Standards.”<sup>20</sup> Two communities that have used this process to address flood risks include the Town of Brookhaven<sup>21</sup> and Village of Freeport.<sup>22</sup>

Optional Additions to Flood Damage Prevention Laws		
Topic	Context	CRS Points
County Administration of Flood Damage Prevention Law	In some cases, county agencies may be willing to assist local towns and villages with floodplain permitting. In all cases, the local municipality remains legally responsible for complying with federal requirements for participation in the National Flood Insurance Program. If a county agency is willing to take on the permitting responsibility within a town or village, a formal memorandum of understanding must be signed by both parties.	N/A
Establishing a Design Flood Elevation	Adopt a regulatory flood elevation that exceeds the base flood elevation. With freeboard required by the Uniform Code, structures are further elevated. (Activity 430)	Up to 500
Compensatory Storage	Avoid increased flood risk from fill or structures that occupy space below the base flood elevation in floodplains by requiring the lost flood water storage to be compensated in an excavated area. (Activity 432a)	Up to 140
Repetitive Damage	Allow insured structures that have been repetitively damaged over time to qualify for up to \$30,000 in additional flood insurance claim funds to be used toward elevating, floodproofing, demolishing or relocating the structure even if it was not substantially damaged by a single flood. CRS points are available for flood protection assistance, floodplain management planning, acquisition and relocation, and flood protection applying to repetitively damage structures.	N/A
Cumulative Substantial Improvement	Require structures to meet flood protection requirements by combining the value of several improvements over time to a structure to meet the definition of “substantial improvement.” (Activity 432d)	Up to 90
Protection of Critical Facilities	Exclude critical public and private facilities from the 100- and 500-year floodplain. (Activity 432f)	Up to 80
Areas Behind Levees or Below High Hazard Dams	Apply flood protection development standards to areas below dams or behind levees.	N/A

Dry Land Access	Require dry land access to principal structures. This would be considered an “other higher standard” in CRS parlance. (Activity 432o)	Up to 100
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RESOURCES

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The NYS Department of Environmental Conservation, Division of Water, Bureau of Flood Protection and Dam Safety may be reached at 518-402-8185 or by email at [floodplain.floodplain@dec.ny.gov](mailto:floodplain.floodplain@dec.ny.gov).

*No Adverse Impact: A Toolkit for Common Sense Floodplain Management.* (2003). Association of State Floodplain Managers<sup>23</sup>

*National Flood Insurance Program Community Rating System Coordinator’s Manual.* (2017). FEMA FIA-15.<sup>24</sup>

Unit 6: Additional Regulatory Measures. In *Managing Floodplain Development Through the NFIP.* (1998).<sup>25</sup>

### 4.3.1 County Administration of Flood Damage Prevention Law

The model local law for flood damage prevention, provided by the NYSDEC Bureau of Flood Protection and Dam Safety, includes the designation of a local administrator to administer the law and grant or deny floodplain permits. While this job is typically performed by a municipal official, it may also be delegated to the county in which the municipality is located. For example, the Town of New Berlin (NY), transferred administration of its flood damage prevention law to the County of Chenango in 1987 by a memorandum of agreement. The arrangement was codified by local law in 2010, designating the Chenango County Code Enforcement Office as Local Administrator. According to the Chenango County Hazard Mitigation Plan, 19 towns and 6 villages have designated the county as the floodplain administrator.<sup>26</sup> An example of an intermunicipal agreement for floodplain management between Chenango County and the Town of Sherburne is on the town’s website.<sup>27</sup> A model memorandum of understanding is also available from the NYSDEC Bureau of Flood Protection and Dam Safety.

In all cases, responsibility for complying with federal requirements for participation in the National Flood Insurance Program remains with the municipality. County administration of the local floodplain law requires a formal legal delegation through a memorandum of understanding (MOU). Where the county agrees to take on the local administration, the local municipality may benefit from full-time county staff that are knowledgeable and may be more able to effectively administer floodplain development standards.

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#### USAGE

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Work with the county to prepare a memorandum of agreement whereby the county agrees to assume the duties associated with the municipal flood damage prevention law. Amend the “Administration” section of the existing municipal flood damage prevention law to designate the appropriate county office or officer as the Local Administrator (generally Section 4.1).

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#### ADAPTED FROM THE FOLLOWING SOURCE

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Town of New Berlin (NY) Municipal Code, Chapter 91 Flood Damage Prevention, Article IV Administration, Section 91-10<sup>28</sup>

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#### LANGUAGE

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Section 4.1 Designation of the Local Administrator.

The [*insert county name*] County Code Enforcement Office is hereby appointed Local Administrator to administer and implement this chapter by granting or denying floodplain development permits in accordance with its provisions.

### 4.3.2 Establishing a Design Flood Elevation

Recent storms have shown us that some Flood Insurance Rate Maps (FIRMs) may no longer depict the true base flood elevation and Special Flood Hazard Area boundaries. Even if the FIRM predicted flood elevations perfectly, buildings constructed to the elevations shown on the FIRM will offer protection only against the 100-year flood level (i.e., the one percent annual chance flood level or base flood elevation). Many floods result in flood levels that exceed the BFE, and buildings constructed to the minimum elevation could sustain flood damage.<sup>29</sup>

FIRMs do not account for the following:

- Shoreline erosion, dune loss, land subsidence, and sea level rise;
- Several severe storms occurring over a short period of time;
- Topographic and bathymetric changes, upland development, and addition of impervious surfaces that affect drainage and/or flooding;
- Degradation or settlement of seawalls, levees, and floodwalls; and
- Changes in storm climatology (frequency and severity) due to natural climate variations or climate change.<sup>30</sup>

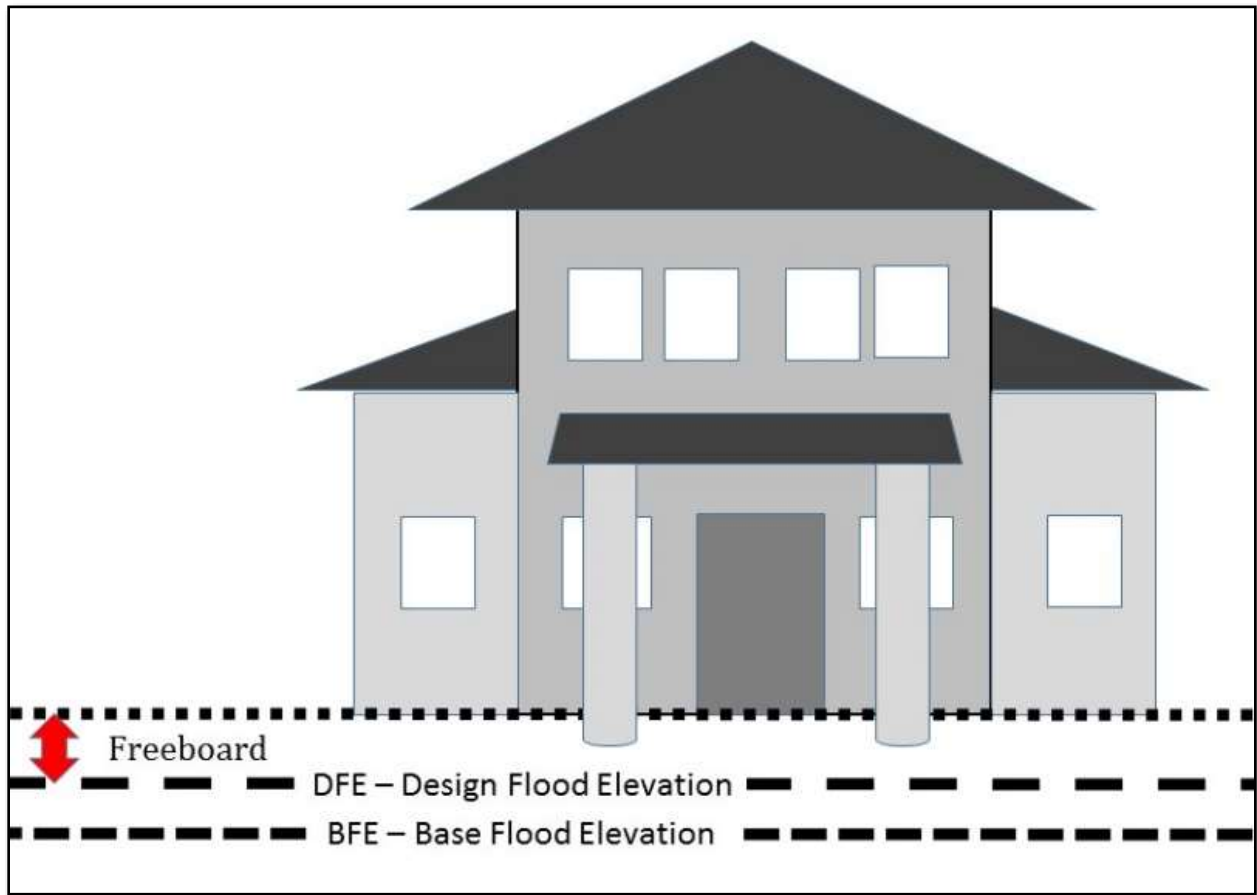
Thus, use of the mapped 100-year floodplain and flood elevations as the basis for risk reduction may no longer be sufficiently protective. During Superstorm Sandy in 2012, the remnants of Hurricanes Irene and Lee in 2011, and several localized supercell thunderstorms in 2013, flood levels exceeded the BFE in some areas and extended far beyond the Special Flood Hazard Area shown on the FIRM.<sup>31</sup>

The Uniform Code uses base flood elevations (BFE) to establish design flood elevations (DFE). The DFE must be at least as high as the BFE. Once the DFE is established, it is adjusted by adding a certain amount of freeboard to it. Freeboard is additional height above the DFE to provide a margin of safety against uncertainties and future conditions.<sup>32</sup> All new or substantially improved structures are required by the Uniform Code to have a specified amount of freeboard. Floodplain elevations are expressed as the BFE or the DFE. (Note: commercial buildings can be floodproofed.)

Municipalities may feel a need to put more space between potential flood waters and the lowest floor of buildings to account for current and future increases in flood stages not reflected in the FIRM. The Uniform Code allows them to do this by establishing a DFE that is higher in all or part of the municipality than the BFE. Freeboard would then be measured from the higher design flood elevation.

FEMA recommendations for building owners also provide guidance to municipalities considering adoption of a design flood elevation. FEMA recommends that where a building is situated in one flood zone but is close to a more hazardous zone, property owners consider designing, elevating, and using construction methods as if the building were located in the more hazardous zone.

Another consideration should be the Limit of Moderate Wave Action, or LiMWA, which is the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent-annual-chance flood event.<sup>33</sup>



FEMA suggests anticipation of future conditions, such as Zone A flood conditions extending landward of the Special Flood Hazard Area boundary into Zone X (extend the freeboard elevation landward until the ground rises to this elevation).<sup>34</sup>

Municipalities may also designate a DFE based on the climate-informed science guideline elevation recommended by the New York State Flood Risk Management Guidance<sup>35</sup> for multi-family and large non-residential structures. This guideline would provide additional protection for smaller structures. While additional nuances are included in the guidance document, the general guidance for tidal and nontidal areas is below:

- In nontidal areas, structures should be sited or elevated such that the lowest floor is at or higher than the higher of the following: (a) the vertical flood elevation and corresponding horizontal floodplain that result from increasing the current one-percent annual chance peak flow (Q100) to account for projected future flows, adding two feet of freeboard to the resultant flood level and extending this level to its intersection with the ground, or (b)

the vertical flood elevation and corresponding horizontal floodplain subject to flooding from the 0.2-percent annual chance flood.

- In tidal areas, such as Coastal High Hazard Areas and Coastal A Zones, structures should be sited or elevated such that the bottom of the lowest horizontal structural member is at or higher than the higher of the following elevations, considering feasibility, project costs, risk tolerance and environmental effects: (a) the vertical flood elevation and corresponding horizontal floodplain that result from adding the medium sea-level rise projection over the expected service life of the structure, plus two feet of freeboard, to the BFE and extending this level to its intersection with the ground, or (b) the vertical flood elevation and corresponding horizontal floodplain subject to flooding from the 0.2-percent annual chance flood.

In all cases, the DFE may not be lower than the BFE. The following steps should be taken to establish a design flood elevation in consultation with the NYSDEC Bureau of Flood Protection and Dam Safety:

(1) Develop Findings. Make a case for exceeding the BFE, which should be reflected in the findings statement in the local law. For example, the municipality could cite the age of the current flood analysis that established the BFE; change in conditions since the Flood Insurance Study was done; describe floods of record that exceeded the BFE; anticipate future increases in flood levels based on upland development or sea level rise; cite recent events of extreme precipitation leading to inundation; or number of damage claims due to flooding or coastal storm surges.

(2) Choose a Design Flood Elevation. Based on the current and anticipated conditions in the municipality, select a design flood elevation. The DFE must be equal to or exceed the BFE. The State Flood Risk Management Guidance for State agencies recommends an approach in tidal areas that incorporates projected sea-level rise, and also recommends adjustments for increased riverine flow.<sup>36</sup>

The Uniform Code requires a two-foot freeboard requirement above the DFE. Should a municipality adopt a higher DFE, the two-foot freeboard requirement would be on top of that.

(3) Create a DFE map. Here are a few examples of how that could be accomplished:

- Modify the FIRM map to designate the 500-year flood elevation as the new DFE and show the 500-year floodplain.
- Develop a digital flood layer that uses the FIRM flood elevations and includes a notation that the DFE is the base flood elevation plus a specified amount of additional height.

- Modify the FIRM to adjust the boundaries of various flood zones to reflect historical deficiencies in the map, as well as anticipated changes in flooding patterns or sea level rise.
- Create a new map using future-conditions hydrology (including sea level rise) and more accurate topographic data than the FIRM. New flood studies undertaken for flood mapping are eligible for CRS points under Activity 410, Floodplain Mapping.

(4) Adopt a DFE map. Amend the municipal flood damage protection law to refer to the DFE map.

(5) If there is a physical change to the floodplain, DEC and FEMA must be informed. Without a physical change, it is suggested that a municipality inform the NYSDEC Bureau of Flood Protection and Dam Safety so the agency can better respond to questions about the municipality.

### **Establishing a Design Flood Elevation and Expanding Special Flood Hazard Areas**

The model provided would amend the municipality’s Flood Damage Prevention law or similar section of the zoning law to replace the current practice of defining areas of special flood hazard as they relate to the 100-year-flood (i.e., the one percent annual chance flood) with a more expansive definition of a flood hazard area, and increase the elevation from which freeboard is measured. While the option provided designates the 500-year-flood elevation as the “Design Flood Elevation,” a climate-informed science elevation could also be used.

Following serious flooding in 2008, the City of Cedar Falls (IA) adopted the 500-year (i.e., 0.2 percent annual chance) floodplain boundary as the locally regulated floodplain and now requires structures located within the boundary to be elevated one foot above the 500-year flood elevation. The language provided below has a similar effect but is based on amendments to language standard to New York flood damage prevention laws.

The following model is appropriate for communities that have flood maps, however, it is not written to apply to New York City where the Uniform Code is not applicable. The 500-year-flood standard may be most appropriate for non-tidal areas. The “flood hazard map” referred to in the local law would be a map showing land in the floodplain within a community subject to a 0.2 percent or greater chance of flooding in any given year (i.e., the 500-year-flood). The Uniform Code addresses the scenario where a map does not provide a flood elevation in the mapped flood hazard area.

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### **RESOURCE**

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*Using a Digital Flood Insurance Rate Map (DFIRM).* (2010). FEMA Fact Sheet No. 1.3. <sup>37</sup>

*Designing for Flood Levels Above the BFE After Sandy.* (2013) FEMA RA5. <sup>38</sup>



*Coastal Construction Manual, Third Edition.* (2000). FEMA 55.<sup>39</sup>

*Importance of the Limit of Moderate Wave Action (LiMWA).* FEMA Fact Sheet FPM 1.<sup>40</sup>

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## USAGE

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Amend the municipal Flood Damage Prevention Law to establish a design flood elevation and expand the areas of special flood hazard.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions. Not all sections of a typical Flood Damage Prevention Law are shown.

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## ADAPTED FROM THE FOLLOWING SOURCE

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Language prepared by NYS Department of State staff with the assistance from staff in the NYS Department of Environmental Conservation Bureau of Flood Protection and Dam Safety.

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## LANGUAGE

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### **SECTION 1.0**

*Amend the Objectives section as shown. Additions are underlined, deletions are struck out.*

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### **1.3 OBJECTIVES**

The objectives of this local law are:

- (1) to protect human life and health;
- (2) to minimize expenditure of public money for costly flood control projects;
- (3) to minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- (4) to minimize prolonged business interruptions;
- (5) to minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, sewer lines, streets and bridges located in flood hazard areas ~~of special flood hazard~~;

- (6) to help maintain a stable tax base by providing for the sound use and development of flood hazard areas ~~of special flood hazard~~ so as to minimize future flood blight areas;
- (7) to provide that developers are notified that property is in ~~an~~ a flood hazard area ~~of special flood hazard~~; and,
- (8) to ensure that those who occupy the flood hazard areas ~~of special flood hazard~~ assume responsibility for their actions.

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## SECTION 2.0: DEFINITIONS

*Add or Amend the following definitions. Additions are underlined, deletions are struck out.*

“Design Flood Elevation (DFE)” is the elevation of the 0.2 percent or greater annual chance flood, shown as either a shaded X or a B zone in the community’s Flood Insurance Rate Map, relative to the datum specified on the community’s flood hazard map. Where there is no shaded X or B zone, but there is a base flood elevation, the Design Flood Elevation shall be the base flood elevation plus [insert number such as two] feet.

**"Elevated building"** means a non-basement building (i) built, in the case of a building in Zones A1-A30, AE, A, A99, AO, AH, B, C, X, or D, to have the top of the elevated floor, or in the case of a building in Zones V1-30, VE, or V, to have the bottom of the lowest horizontal structure member of the elevated floor, elevated above the ground level by means of pilings, columns (posts and piers), or shear walls parallel to the flow of the water and (ii) adequately anchored so as not to impair the structural integrity of the building during a flood of up to the magnitude of the ~~base~~ design flood. In the case of Zones A1-A30, AE, A, A99, AO, AH, B, C, X, or D, "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of flood waters. In the case of Zones V1-V30, VE, or V, "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 that ~~meet~~ the federal standards comply with the Uniform Code.

“Flood Hazard Map” is the map delineating flood hazard areas adopted by the [City Council/Town Board/Village Board of Trustees].

“Flood Hazard Area” is the area subject to flooding during the design flood.

“Uniform Code” is the New York State Uniform Fire Prevention and Building Code adopted pursuant to Article 11 of the Executive Law, as currently in effect and as hereafter amended from time to time.

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**3.1 LANDS TO WHICH THIS LOCAL LAW APPLIES**

*Amend as shown. Additions are underlined, deletions are struck out.*

This local law shall apply to all flood hazard areas ~~of special flood hazard~~ within the jurisdiction of the \_\_\_\_\_ of \_\_\_\_\_.

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**3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD AND FLOOD HAZARD AREAS**

*Amend title of section as show above and the text below. Local laws vary in how the information is presented, so the example below is for illustrative purposes.*

The areas of special flood hazard are identified and defined on the following documents prepared by the Federal Emergency Management Agency:

- 1) Flood Insurance Rate Map Panel Numbers and Effective Dates:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (2) A scientific and engineering report entitled "Flood Insurance Study, \_\_\_\_\_ County, New York, dated \_\_\_\_\_.

- (3) Flood Boundary and Floodway Map Panel Numbers and Effective Dates:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (4) The [City/Town/Village of \_\_\_\_\_] hereby establishes a Design Flood Elevation that defines the Flood Hazard Area as that land shown on the above listed Flood Insurance Rate Map Panels as the land in the floodplain within a community subject to a 0.2 percent or greater chance of flooding in any given year. This area includes B or shaded X zone adjacent to or separated from a Zone A, AE, AH, AO, A1-A30, A99, V, VO, VE, or V1-V30.

The above documents are hereby adopted and declared to be a part of this Local Law. The Flood Insurance Study and/or maps are on file at: \_\_\_\_\_.

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**4.2 THE FLOODPLAIN DEVELOPMENT PERMIT**

**4.2-1 PURPOSE**

*Amend as shown. Additions are underlined, deletions are struck out.*

A floodplain development permit is hereby established for all construction and other development to be undertaken in flood hazard areas ~~of special flood hazard~~ in this community for the purpose of protecting its citizens from increased flood hazards and insuring that new development is constructed in a manner that minimizes its exposure to flooding. It shall be unlawful to undertake any development in ~~an~~ a flood hazard area ~~of special flood hazard~~, as shown on the Flood Insurance Rate Map enumerated in Section 3.2, without a valid floodplain development permit. Application for a permit shall be made on forms furnished by the Local Administrator and may include, but not be limited to: plans, in duplicate, drawn to scale and showing: the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing.

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## **4.2 THE FLOODPLAIN DEVELOPMENT PERMIT**

### **4.4-2 USE OF OTHER FLOOD DATA**

*Amend as shown. Additions are underlined, deletions are struck out.*

- (1) When the Federal Emergency Management Agency has designated areas of special flood hazard on the community's Flood Insurance Rate map (FIRM) but has neither produced water surface elevation data (these areas are designated Zone A or V on the FIRM) nor identified a floodway, the Local Administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, including data developed pursuant to paragraph 4.3(7), as criteria for requiring that new construction, substantial improvements or other proposed development meet the requirements of this law.
- (2) When base flood elevation data are not available, the Local Administrator may use flood information from any other authoritative source, such as historical data, to establish flood elevations within the flood hazard areas ~~of special flood hazard~~, for the purposes of this law.

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## **4.2 THE FLOODPLAIN DEVELOPMENT PERMIT**

### **4.4-7 CERTIFICATE OF COMPLIANCE**

*Amend as shown. Additions are underlined, deletions are struck out.*

- (l) In flood hazard areas ~~of special flood hazard~~, as determined by documents enumerated in Section 3.2, it shall be unlawful to occupy or to permit the use or occupancy of any building or premises, or both, or part thereof hereafter created, erected, changed, converted or wholly or partly altered or enlarged in its use or structure until a certificate of compliance has been issued by the Local

Administrator stating that the building or land conforms to the requirements of this local law.

- (2) A certificate of compliance shall be issued by the Local Administrator upon satisfactory completion of all development in flood hazard areas ~~of special flood hazard~~.
- (3) Issuance of the certificate shall be based upon the inspections conducted as prescribed in Section 4.4-5, INSPECTIONS, and/or any certified elevations, hydraulic data, floodproofing, anchoring requirements or encroachment analyses which may have been required as a condition of the approved permit.

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## **SECTION 5.0 CONSTRUCTION STANDARDS**

*Amend as shown. Additions are underlined, deletions are struck out.*

### **5.1 GENERAL STANDARDS**

The following standards apply to all new development, including new ~~and~~ or substantially improved structures, in the flood hazard areas ~~of special flood hazard shown on the Flood Insurance Rate Map designated as described~~ shown on the Flood Insurance Rate Map designated in Section 3.2.

All buildings and structures in this jurisdiction are subject to the Uniform Code and must comply with all applicable requirements of the Uniform Code. In the event of a conflict between any construction-related requirement of this local law and the provisions of the Uniform Code, the provisions of the Uniform Code shall control.

No variance granted under any provision of this local law can modify or vary any provision or requirement of the Uniform Code. Provisions or requirements of the Uniform Code can be modified or varied only in accordance with the provisions established by Part 1205 of Title 19 of the New York Codes, Rules, and Regulations, as currently in effect and as hereafter amended from time to time.

#### **5.1-1 SUBDIVISION AND DEVELOPMENT PROPOSALS**

The following standards apply to all new subdivision proposals and other proposed development in flood hazard areas ~~of special flood hazard~~ (including proposals for manufactured home and recreational vehicle parks and subdivisions):

- (1) Proposals shall be consistent with the need to minimize flood damage;
- (2) Public utilities and facilities such as sewer, gas, electrical and water systems shall be located and constructed so as to minimize flood damage; and,

- (3) Adequate drainage shall be provided to reduce exposure to flood damage.
- (4) Proposed development shall not result in physical damage to any other property (e.g., stream bank erosion or increased flood velocities). If requested by the Local Administrator, the applicant shall provide a technical analysis, by a licensed professional engineer, demonstrating that this condition has been met.
- (5) Proposed development shall be designed, located, and constructed so as to offer the minimum resistance to the flow of water and shall be designed to have a minimum effect upon the height of flood water.
- (6) Any equipment or materials located in a flood hazard area ~~of special flood hazard~~ shall be elevated, anchored, and floodproofed as necessary to prevent flotation, flood damage, and the release of hazardous substances as required by the Uniform Code.
- (7) No alteration or relocation of a watercourse shall be permitted unless:
  - i. a technical evaluation by a licensed professional engineer demonstrates that the altered or relocated segment will provide conveyance equal to or greater than that of the original stream segment and will not result in physical damage to any other property;
  - ii. if warranted, a conditional revision of the Flood Insurance Rate Map is obtained from the Federal Emergency Management Agency, with the applicant providing the necessary data, analyses, and mapping and reimbursing the Town of Dix for all fees and other costs in relation to the application; and
  - iii. the applicant provides assurance that maintenance will be provided so that the flood carrying capacity of the altered or relocated portion of the watercourse will not be diminished.

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## **5.2 STANDARDS FOR ALL STRUCTURES**

*Amend as shown. Additions are underlined, deletions are struck out*

The following standards apply to all new development, including new and substantially improved structures, in the flood hazard areas ~~of special flood hazard~~ shown on the Flood Insurance Rate Map designated in Section 3.2. Any alteration, repair, reconstruction, addition, or improvements to a structure that was built or substantially improved after the adoption of floodplain management regulations shall meet the requirements for new construction.

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### 5.2-3 UTILITIES

*Amend as shown. Additions are underlined, deletions are struck out*

- (1) New and replacement electrical systems, equipment, and components, heating, ventilating, air conditioning, plumbing connections, and other service equipment shall be designed and constructed in accordance with the Uniform Code ~~located at least two feet above the base flood elevation or be designed to prevent water from entering and accumulating within the components during a flood and to resist hydrostatic and hydrodynamic loads and stresses.~~ Electrical wiring and outlets, switches, junction boxes and panels shall be elevated or designed to prevent water from entering and accumulating within the components unless they conform to the appropriate provisions of the electrical part of the Building Code of New York State or the Residential Code of New York State for location of such items in wet locations;
- (2) New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
- (3) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters. Sanitary sewer and storm drainage systems for buildings that have openings below the ~~base~~ design flood elevation shall be provided with automatic backflow valves or other automatic backflow devices that are installed in each discharge line passing through a building's exterior wall; and,
- (4) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- (5) Gas and liquid fuel tanks must be (i) elevated at least two feet above the ~~base~~ design flood elevation or at least three feet above grade when no ~~base~~ design flood elevation data are available or (ii) properly anchored to resist floatation and the effects of scour. Fill caps and fittings below the ~~base~~ design flood elevation must be tested to be liquid tight. Tank vent openings must be two or more feet above the ~~base~~ design flood elevation or three or more feet above grade when no ~~base~~ design flood elevation data are available.

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### 5.3 RESIDENTIAL STRUCTURES

*Amend as shown. Communities with Coastal High Hazard Areas should make corresponding changes to sections on residential structures. Additions are underlined, deletions are struck out*

#### 5.3-1 ELEVATION

The following standards apply to new and substantially improved residential structures located in flood hazard areas of special flood hazard, in addition to the requirements in sub-sections 5.1-1, SUBDIVISION PROPOSALS, and 5.1-2, ENCROACHMENTS, and Section 5.2, STANDARDS FOR ALL STRUCTURES.

- (1) Within all flood hazard areas, all new construction and substantial improvements shall be constructed in accordance with the Uniform Code. ~~Within Zones A1 A30, AE and AH and also Zone A if base flood elevation data are available, new construction and substantial improvements shall have the top of the lowest floor (including basement) elevated to or above two feet above the base flood elevation.~~
- ~~(2) Within Zone A, when no base flood elevation data are available, new construction and substantial improvements shall have the top of the lowest floor (including basement) elevated at least three feet above the highest adjacent grade.~~
- ~~(3) Within Zone AO, new construction and substantial improvements shall have the top of the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's Flood Insurance Rate Map enumerated in Section 3.2 (at least two feet if no depth number is specified).~~
- (4) (2) Within Zones AH and AO, adequate drainage paths are required to guide flood waters around and away from proposed structures on slopes.

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#### **5.4 NON-RESIDENTIAL STRUCTURES**

*Amend as shown. Communities with Coastal High Hazard Areas should make corresponding changes to sections on non-residential structures. Additions are underlined, deletions are struck out.*

The following standards apply to new and substantially improved commercial, industrial and other non-residential structures located in areas of special flood hazard, in addition to the requirements in sub-sections 5.1-1, SUBDIVISION PROPOSALS, and 5.1-2, ENCROACHMENTS, and Section 5.2, STANDARDS FOR ALL STRUCTURES.

- (1) Within all flood hazard areas, all new construction and substantial improvements of nonresidential buildings shall be constructed in accordance with the Uniform Code. Such buildings and all attendant utility and sanitary facilities shall also comply with the Uniform Code. ~~Within Zones A1 A30, AE and AH, and also Zone A if base flood elevation data are available, new construction and substantial improvements of any non-residential structure shall either:~~



~~(i) have the top of the lowest floor, including basement or cellar, elevated to or above two feet above the base flood elevation; or~~

~~(ii) be floodproofed so that the structure is watertight below two feet above the base flood elevation, including attendant utility and sanitary facilities, with walls substantially impermeable to the passage of water. All structural components located below the base flood level must be capable of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.~~

~~(2) Within Zone AO, new construction and substantial improvements of non-residential structures shall:~~

~~(i) have the top of the lowest floor (including basement) elevated above the highest adjacent grade at least as high as two feet above the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified), or~~

~~(ii) together with attendant utility and sanitary facilities, be completely floodproofed to that level to meet the floodproofing standard specified in subsection 5.4(1)(ii)~~

~~(3) If the structure is to be floodproofed, a licensed professional engineer or architect shall develop and/or review structural design, specifications, and plans for construction. A Floodproofing Certificate or other certification shall be provided to the Local Administrator that certifies the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of Section 5.4(1)(ii), including the specific elevation (in relation to mean sea level) to which the structure is to be floodproofed.~~

~~(4)(3) Within Zones AH and AO, adequate drainage paths are required to guide flood waters around and away from proposed structures on slopes.~~

~~(5) Within Zone A, when no base flood elevation data are available, the top of the lowest floor (including basement) shall be elevated at least three feet above the highest adjacent grade.~~

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## **5.5 MANUFACTURED HOMES AND RECREATIONAL VEHICLES**

*Amend as shown. Additions are underlined, deletions are struck out.*

The following standards in addition to the standards in Section 5.1, GENERAL STANDARDS, and Section 5.2, STANDARDS FOR ALL STRUCTURES apply, as indicated, in flood hazard areas ~~of special flood hazard~~ to manufactured homes and to recreational vehicles which are located in flood hazard areas ~~of special flood hazard~~.

- (1) Recreational vehicles placed on sites within Zones A, A1-A30, AE, AH, and AO shall either:
  - (i) be on site fewer than 180 consecutive days,
  - (ii) be fully licensed and ready for highway use, or
  - (iii) meet the requirements for manufactured homes in paragraphs 5.5(2), (3) and (4).

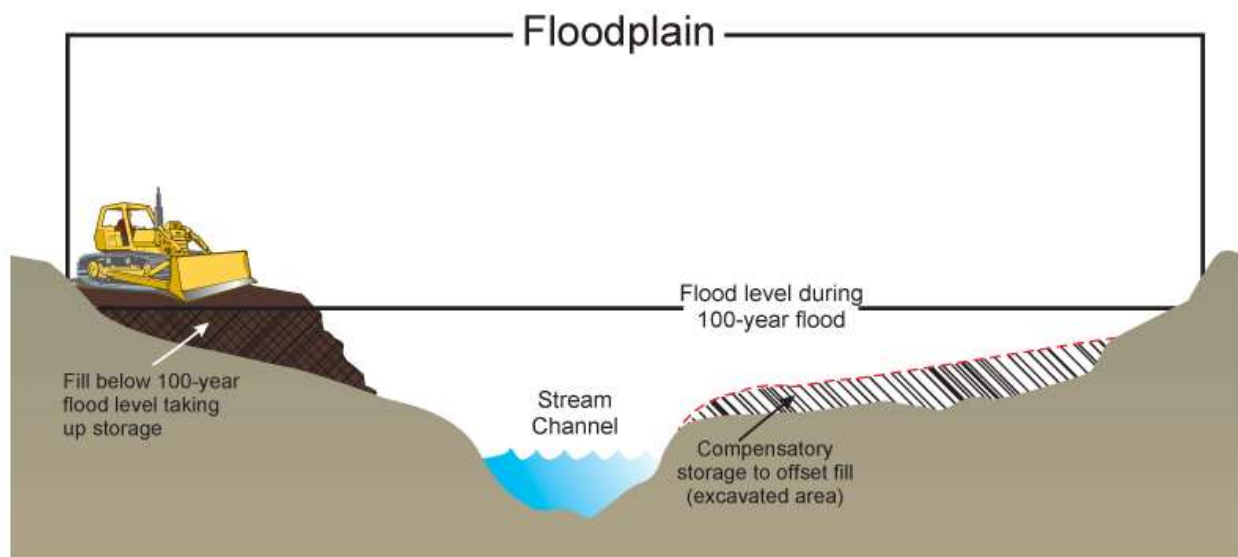
A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions.

- ~~(2) A-Within all flood hazard areas, manufactured home that is placed or substantially improved homes shall be installed in accordance with the Uniform Code in Zones A1-A30, AE and AH shall be elevated on a permanent foundation such that the top of the lowest floor is elevated to or above two feet above the base flood elevation and is securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.~~
- ~~(3) Within Zone A, when no base flood elevation data are available, new and substantially improved manufactured homes shall be elevated such that the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above the highest adjacent grade and are securely anchored to an adequately anchored foundation system to resist flotation, collapse or lateral movement.~~
- ~~(4) Within Zone AO, the floor shall be elevated above the highest adjacent grade at least as high as two feet above the depth number specified on the Flood Insurance Rate Map enumerated in Section 3.2 (at least two feet if no depth number is specified).~~

### 4.3.3 Compensatory Storage

The NFIP floodway standard restricts new development from obstructing the flow of water and increasing flood heights. However, this provision does not address the need to maintain flood storage. Especially in flat areas, the floodplain provides a valuable function by storing floodwaters. Earthen fill is sometimes placed in floodplains to reduce flood risk to the filled area. When fill or buildings are placed in a Special Flood Hazard Area (SFHA), the flood storage areas are lost and flood heights will go up because there is less room for the floodwaters. This is particularly important in smaller floodplains.

The placement of fill is considered development and requires a floodplain development permit. The use of fill is prohibited for structural support of buildings in V Zones and LiMWA areas. Fill is prohibited within the *floodway* unless it has been demonstrated that it will not result in any increase in the BFE. Some communities limit the use of fill in the *floodway fringe* (area of a riverine floodplain outside of the floodway) to protect storage capacity or require compensatory storage.



Source: City of Lincoln (NE) <https://lincoln.ne.gov/city/pworks/watershed/flood/compensatory-storage.htm>

The benefits of using fill accrue to the developer and to the property owner, while the potential problems accrue to neighbors, taxpayers, the municipality, or the environment. Earthen fill reduces floodplain storage capacity and can have an adverse impact on native vegetation, wetlands, drainage, and water quality. According to FEMA, flood insurance studies assume that when the entire riverine floodplain is filled outside of the floodway, an increase of up to one foot in the Base Flood Elevation will occur at the location of the encroachment.<sup>41</sup>

A municipality may wish to avoid a potential increase in base flood elevation, and to make certain that an encroachment does not result in increased flood elevations upstream or downstream of

the development, by requiring developments that encroach into the floodplain to provide compensatory flood storage.

The Community Rating System credits prohibition of fill and the requirement to provide compensatory storage under Activity 430, Section 431.f.

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## USAGE

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Amend the Municipal Flood Damage Prevention Law to require compensatory storage be provided if encroachments are made to a floodplain.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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## ADAPTED FROM THE FOLLOWING SOURCE

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Town of Wappinger (NY) Municipal Code, Chapter 133 Flood Damage Prevention, Section 133-14 General Standards<sup>42</sup>

Town of Marlborough (NY) Municipal Code, Chapter 97 Flood Damage Prevention, Section 97-15 Floodways<sup>43</sup>

ASFPM Floodplain Regulations Committee, *A Guide for Higher Standards in Floodplain Management*<sup>44</sup>

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## LANGUAGE

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*Add a new paragraph (3) to the "Encroachments" section of the municipal Flood Damage Prevention Law under "General Standards" (Generally Section 5.1-2):*

(3) Whenever any portion of a floodplain is authorized for development, the volume of space occupied by the authorized fill or structure below the base flood elevation shall be compensated for and balanced by a hydraulically equivalent volume of excavation taken from below the base flood elevation at or adjacent to the development site. All such excavations shall be constructed to drain freely to the watercourse. No area below the waterline of a pond or other body of water can be credited as a compensating excavation.

OR

(3) Fill within the special flood hazard area shall result in no net loss of natural floodplain storage. The volume of the loss of floodwater storage due to filling in the special flood hazard area shall be offset by providing an equal volume of flood storage by excavation or other compensatory measures at or adjacent to the development site.

OR

(3) When floodway data is provided or available for a particular site pursuant to [insert section addressing use of other flood data, generally Section 4.4-2], all encroachments, including fill, new construction and substantial improvements and other development, are prohibited within the limits of the floodway unless a technical evaluation demonstrates that such encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

### 4.3.4 Repetitive Damage

FEMA’s Increased Cost of Compliance (ICC) flood insurance coverage<sup>45</sup> provides up to \$30,000 toward elevating, floodproofing (non-residential buildings), demolishing or relocating a structure that has been substantially damaged or repetitively damaged. However, that coverage is only available to a repetitively damaged structure within a municipality that has adopted an ICC definition in its local law and uniformly enforces it. For a municipality to add a repetitive damage clause, a change must be made in the “Substantial Damage” definition in its flood damage prevention law.

By including the repetitive damage definition, an insured structure that has been damaged twice within a ten-year period for which the average damage equals or exceeds 25 percent of the market value of the structure would qualify for up to \$30,000 toward elevating, floodproofing, demolishing or relocating the structure.<sup>46</sup>

“For ICC eligibility, a repetitive loss structure must meet all of the following:

- It must be covered by an NFIP flood insurance policy;
- It must have suffered flood damage on at least two occasions during a 10-year period ending on the day of the second loss;
- The cost to repair the flood damage, on average, equaled or exceeded 25 percent of the market value of the building at the time of each of the two flood losses, or cumulatively total 50 percent of the pre-flood market value, as defined by the local floodplain ordinance; and
- In addition to the claim requesting ICC, the NFIP must have paid a previous qualifying claim.”<sup>47</sup>

Even without the repetitive damage clause, ICC coverage is available for an insured structure that has been substantially damaged in a *single* flood event, provided that the local municipality finds in writing that the structure has been substantially damaged by flood.

A municipality with a repetitive damage clause is responsible for keeping track of all flood related structural damages. The requirement to bring a repetitively damaged structure up to code would hold whether or not the property owner carries a flood insurance policy and would apply to a building whether or not there has been a change in ownership of the building.

As of June 2019, this amendment to a local flood damage prevention law would require NYS Code Council approval. The Town Huron received NYS Code Council approval for a local law that included the definition of “substantial damage” proposed below.

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#### RESOURCES

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Section 4: The Community's Role. Increased Cost of Compliance Coverage - Guidance for State and Local Officials. (2003). FEMA 301.<sup>48</sup>

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#### USAGE

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Amend the definition of “substantial damage” contained in the Municipal Flood Damage Prevention Law.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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#### ADAPTED FROM THE FOLLOWING SOURCE

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Town of Huron (NY) Flood Damage Prevention Law, Section 2 Definitions<sup>49</sup>

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#### LANGUAGE

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*Definitions (Generally Section 2.0) - Amend the following definition in the municipal Flood Damage Prevention Law:*

"Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Substantial damage also means flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of such flood event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred.

### 4.3.5 Cumulative Substantial Improvement

The state model flood damage prevention law allows improvements valued at less than 50 percent of a building’s pre-improvement value to be permitted without meeting the flood protection requirements. Over the years, a municipality may issue a succession of permits for different repairs or improvements to the same structures. To protect investment in such structures, the municipality may define “substantial improvement” cumulatively so that once a threshold of improvement within a certain length of time is reached, the structure is considered substantially improved and must meet flood protection requirements.<sup>50</sup> By also adopting the definition of “substantial damage” described in the Repetitive Damage section above, the municipality can further strengthen its ability to manage flood damage potential when structures are proposed for reconstruction after damaging floods.

As of June 2019, this amendment to a local flood damage prevention law would require NYS Code Council approval. The Town Huron received NYS Code Council approval for a local law that included the changes proposed below.

An alternative approach, not shown here, is to decrease the 50 percent threshold in the existing “substantial improvement” definition to a lower number or change the 10-year tracking period. If that is done, a definition of “cumulative substantial improvement” would not be needed.

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#### USAGE

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Amend the municipal Flood Damage Prevention Law to define “substantial improvement” cumulatively and make such substantially improved structures subject to flood protection requirements.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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#### ADAPTED FROM THE FOLLOWING SOURCE

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Town of Huron (NY) Flood Damage Prevention Law, Section 2 Definitions<sup>51</sup>

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#### LANGUAGE

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*Definitions (Generally Section 2.0) - Amend the definitions of “substantial improvement” and “substantial damage,” and add a definition for “cumulative substantial improvement” to the municipal Flood Damage Prevention Law:*

“Cumulative Substantial Improvement” means any reconstruction, rehabilitation, addition, or other improvement of a structure that equals or exceeds 50 percent of the



market value of the structure at the time of the improvement or repair when counted cumulatively for 10 years.

“Substantial Damage” means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Substantial damage also means flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of such flood event, on the average, equals or exceeds 25 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. Substantial improvement also means “cumulative substantial improvement.” The term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. The term does not, however, include either:

- (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 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."

### 4.3.6 Protection of Critical Facilities

Critical facilities should not be located within a flood prone area due to the serious danger to life, health, or widespread social or economic dislocation that would result when the facility is subjected to flooding. Such facilities either have the potential to create significant environmental or health risk or are needed for municipal support services during and after a disaster.

A municipality may vary the definition of “critical facilities” in its flood damage prevention law. For example, state regulations relating to state projects in flood hazard areas list the following types of critical facilities:

- Facilities designed for bulk storage of chemicals, petrochemicals, hazardous or toxic substances or floatable materials;
- Hospitals, rest homes, correctional facilities, dormitories, patient care facilities;
- Major power generation, transmission or substation facilities, except for hydroelectric facilities;
- Major communications centers, such as civil defense centers; or
- Major emergency service facilities, such as central fire and police stations.<sup>52</sup>

These are all facilities that can cause significant dangers to life, health, and/or the regional economy in the event of a flood or are essential for disaster recovery operations. However, other facilities should also be considered critical. This includes major employment centers, water and wastewater utilities.

Requiring protection for critical facilities serves several purposes: it reduces threats to life and health; it reduces damage to vital public facilities; it reduces pollution of floodwaters by hazardous materials; and it ensures that the facilities will be operable during most flood emergencies. Protection and proper siting of those facilities makes communities more resilient. To be proactive about the siting of critical public and private facilities, communities can provide for their inclusion or exclusion through zoning and/or through the amendment of the municipal flood damage prevention law.

The Community Rating System (CRS) provides a maximum credit of 100 points to communities that prohibit critical facilities within the 500-year floodplain.

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#### USAGE

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Amend the municipal Flood Damage Prevention Law to add a definition of “critical facilities” and a new construction standard that applies to critical facilities.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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ADAPTED FROM THE FOLLOWING SOURCE

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Town of Wappinger (NY) Municipal Code, Chapter 133 Flood Damage Prevention, Section 133-3 and 133-19<sup>53</sup>

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LANGUAGE

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*Definitions (Generally Section 2.0) - Add the following definition to the municipal Flood Damage Prevention Law:*

“Critical facilities” means:

(1) Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic and/or water-reactive materials;

(2) Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a flood;

(3) Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for flood response activities before, during, and after a flood; and

(4) Public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas before, during, and after a flood.

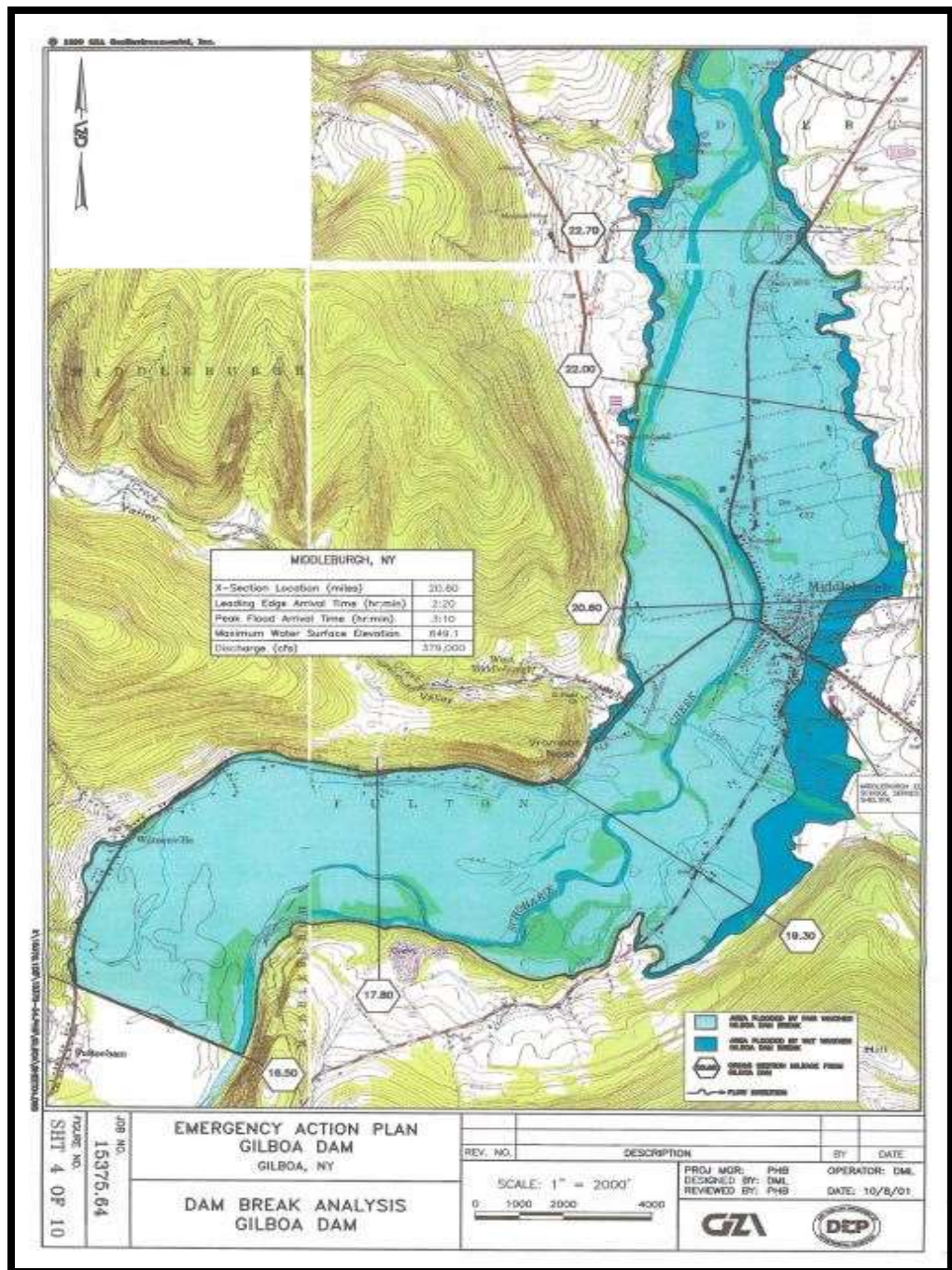
*Add a new construction standard that applies to critical facilities (Generally Section 5).*

Section 5.6 Critical Facilities. In order to prevent potential flood damage to certain facilities that would result in serious danger to life and health, or widespread social or economic dislocation, no new critical facility shall be located within any Area of Special Flood Hazard, or within any 500-year flood zone shown as a B zone or a shaded X zone on the Community’s Flood Insurance Rate Maps.

### 4.3.7 Areas Behind Levees or Below High Hazard Dams

Municipalities may wish to apply flood elevation requirements to areas protected by a dam or levee as if the dam or levee was not there.<sup>54</sup> These areas that meet the requirements contained in 44 CFR 65.10, and have at least three feet of freeboard above the 100-year flood from levees and are accredited by FEMA, are usually not mapped as flood prone on Flood Insurance Rate Maps (FIRMs). However, such dams or levees can fail or overtop.

Sheet 4 of the  
Emergency  
Action Plan for  
the Gilboa  
Dam  
Source:  
Montgomery  
County, NY  
Emergency  
Management  
Office



While the probability of levee or dam failure is low in most areas, the consequences of such failure are large.

A municipality that wishes to apply flood protection development standards to areas below dams or behind levees must first prepare a map of the affected area. Inundation maps related to dam failure may already exist. For example, high and medium hazard dams require emergency action plans that may have maps or descriptions of inundation areas.

As FEMA’s Risk MAP flood mapping program moves forward, it may become easier for a municipality to develop a map using digital FIRMs from FEMA.

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## USAGE

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Adopt a map of the areas protected by a dam or levee (e.g., inundation map).

Amend the municipal Flood Damage Prevention Law to change the definition of “area of special flood hazard” to include areas identified by the municipality on a map of levee protected areas and/or dam failure inundation zones.

Amend the section of the municipal Flood Damage Prevention Law that adopts the FIRM and flood insurance study for the municipality (generally Section 3.2) to include the appropriate maps. (*Not illustrated.*)

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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## ADAPTED FROM THE FOLLOWING SOURCE

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Town of New Scotland (NY) Local Law 1-2015, A Local Law for Flood Damage Prevention<sup>55</sup>

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## LANGUAGE

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*Definitions (Generally Section 2.0) - Add the following definition to the municipal Flood Damage Prevention Law:*

“Area of special flood hazard” is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. This area may be designated as Zone A, AE, AH, AO, A1-A30, A99, V, VO, VE, or V1-V30. It is also commonly referred to as the base floodplain or 100-year floodplain. For purposes of this Local Law, the term “special flood hazard area (SFHA)” is synonymous in meaning with the phrase “area of special flood hazard,” and includes the area identified on the Emergency Action Plan [insert map number(s)], which refers to the [insert name of dam, levee or dike], respectively.

### 4.3.8 Dry Land Access

The Association of State Floodplain Managers (ASFPM) published *A Guide for Higher Standards in Floodplain Management*<sup>56</sup> in 2013 to provide options for municipalities to enhance existing floodplain regulations with options that will further reduce risk and protect floodplain functions. ASFPM suggests model language related to access (ingress and egress) to decrease the likelihood that residents will be stranded in their elevated homes, which would reduce the need for water rescues that place emergency responders at risk. One example of a municipal code that regulates contiguous dryland access is from the City of New London and Outagamie and Waupaca Counties (WI).<sup>57</sup>

The FEMA publication, *Managing Floodplain Development Through the NFIP*, states, “Fire prevention, evacuation and rescue operations are common emergency response activities associated with flooding. The effectiveness and success of these efforts greatly depend on readily available access. However, streets and roads are usually the first things to be inundated in the event of a flood. To ensure access, some communities have enacted ordinance provisions requiring that all roads and other access facilities be elevated to or above the BFE. Some require elevation to within one foot of the BFE so at least fire and rescue equipment can travel on them during a flood.”<sup>58</sup>

A municipality may require development within the area typically covered by floodwaters during the 100-year flood (special flood hazard area or floodplain) to be elevated to or above the base flood elevation and have dry land access to the principal structure. Wisconsin has adopted dry land access provisions by state statute for residential and commercial development with limited exemptions.

The Community Rating System has credited dry land access provisions under Activity 430, Section 431.i in the *CRS Coordinator’s Manual* and the *CRS Application*.<sup>59</sup>

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#### USAGE

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Amend the municipal Flood Damage Prevention Law to add a definition of “dry land access” and add a new construction standard relating to subdivision and development proposals. A construction standard may also be added relating to nonresidential structures.

The changes to a typical Flood Damage Prevention Law are generally shown below in bill drafting format, with underlined text as additions, and text that is struck through as deletions.

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#### ADAPTED FROM THE FOLLOWING SOURCE

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*A Guide for Higher Standards in Floodplain Management.* (2013). ASFPM Floodplain Regulations Committee. <sup>60</sup>

Waukesha (WI) Municipal Code, Chapter 22 Zoning, Section 22.70 Floodplain Zoning<sup>61</sup>

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LANGUAGE

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*Definitions (Generally Section 2.0) - Add the following definition to the municipal Flood Damage Prevention Law:*

“Dry Land Access” means a vehicular access route above the base flood elevation [or, design flood elevation] that connects land located in the floodplain to land outside the floodplain, such as a road with its surface above base flood elevation [or, design flood elevation] and wide enough for wheeled rescue and relief vehicles. [Note: definition based on Waukesha law.]

*Add a new construction standard relating to subdivision and development proposals (Generally Section 5.1-1)*

(8) Contiguous dry land access shall be provided from a proposed principal structure on residential and commercial property to land outside the Special Flood Hazard Area (SFHA).

OR

(8) New development proposals will be designed, to the maximum extent practicable, so residential building sites, walkways, driveways, and roadways are located on land with a natural grade with elevation not less than the base flood elevation [or, design flood elevation] and with dry land access. [Note: this is the ASFPM approach.]

*Add a new construction standard relating to nonresidential structures (Generally Section 5.4)*

(6) New development proposals will be designed, to the maximum extent practicable, so non-residential building sites, walkways, driveways, and roadways are located on land with a natural grade with elevation not less than the base flood elevation [or, design flood elevation] and with dry land access. [Note: this is the ASFPM approach.]



## 4.4 State Model Flood Damage Prevention Laws

The NYS Department of Environmental Conservation (NYSDEC) has three model local laws for flood damage prevention that communities can adopt to join the National Flood Insurance Program (NFIP): one for communities without mapped flood hazard areas, one for communities with standard mapped flood hazards, and another for communities with coastal flood hazard areas.

A flood damage prevention local law should be submitted by the municipality to NYSDEC and the Federal Emergency Management Agency (FEMA) before it is enacted. This local law indicates that if a municipality has mapped flood hazard areas and if development is to occur in those flood hazard areas then the development is required to be built to certain standards, identified in the NFIP's regulations and the Uniform Code. If development is being considered for a Special Flood Hazard Area, then the local floodplain administrator, an office designated in the local law, reviews the development to ensure that construction standards have been met before issuing a floodplain development permit. Non-structural development within a Special Flood Hazard Area is also subject to a local floodplain development permit.

There are several different models. For example:

- Model Local Law A is for communities that do not have a flood map. It is designed to comply with the floodplain management requirements of the National Flood Insurance Program contained in 44 CFR 60.3(a).
- Model Local Law D is for communities that have flood maps but no coastal wave runup zones. It is designed to comply with the floodplain management requirements of the National Flood Insurance Program contained in 44 CFR 60.3(a) through (d). The DEC has included optional administrative provisions in the model local law that are strongly recommended for proper administration.
- Model Local Law E is for communities with coastal wave runup zones. It is designed to comply with the floodplain management requirements of the National Flood Insurance Program contained in 44 CFR 60.3(a) through (e). The DEC has included optional administrative provisions in the model local law that are strongly recommended for proper administration.

Any changes made to a model should be reviewed by the municipal attorney, NYSDEC, and FEMA before they are enacted. NYSDEC and FEMA must be provided a list of any changes to this model at the time of filing. Contact the NYSDEC Bureau of Flood Protection and Dam Safety for a copy of a model law or for more information.<sup>62</sup>



## Endnotes

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- <sup>1</sup> NYS Department of Environmental Conservation. (2015). *Observed and Projected Climate Change in New York State: An Overview*. Retrieved 6/1/18 from [https://www.dec.ny.gov/docs/administration\\_pdf/climbkgncrra.pdf](https://www.dec.ny.gov/docs/administration_pdf/climbkgncrra.pdf)
- <sup>2</sup> *Communities Participating in the National Flood Program*. Community Status Book Report: New York. (2018) FEMA. Retrieved 6/12/18 from <https://www.fema.gov/cis/NY.pdf>
- <sup>3</sup> *No Adverse Impact: A Toolkit for Common Sense Floodplain Management*. (2003). Association of State Floodplain Managers. Retrieved 6/1/18 from [http://www.floods.org/NoAdverseImpact/NAI\\_Toolkit\\_2003.pdf](http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf)
- <sup>4</sup> Kusler, Jon. (2003). *Common Legal Questions about Floodplain Regulations in the Courts*, 2003 Update. Retrieved 6/1/18 from [http://www.floods.org/NoAdverseImpact/FLOODPLAIN\\_REG\\_IN\\_COURTS\\_112603.pdf](http://www.floods.org/NoAdverseImpact/FLOODPLAIN_REG_IN_COURTS_112603.pdf)
- <sup>5</sup> Chapter 4 Regulatory Tools. In *Reducing Damage from Localized Flooding: A Guide for Communities*. (2011). FEMA 511-05. Retrieved 6/1/18 from <https://www.fema.gov/pdf/fima/FEMA511-05-Chapter4.pdf>
- <sup>6</sup> *No Adverse Impact: A Toolkit for Common Sense Floodplain Management*. (2003). Association of State Floodplain Managers. Retrieved 6/1/18 from [http://www.floods.org/NoAdverseImpact/NAI\\_Toolkit\\_2003.pdf](http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf)
- <sup>7</sup> *National Flood Insurance Program Community Rating System Coordinator's Manual*. (2017). FEMA FIA-15. Retrieved 6/1/18 from <https://www.fema.gov/media-library/assets/documents/8768>
- <sup>8</sup> Southern Tier Central Regional Planning and Development Board, *Floodplain Development Standards*. Retrieved 6/1/18 from <http://www.stcplanning.org/index.asp?pageId=108>
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<sup>13</sup> Town of Ancram (NY) Zoning Law, Article V Supplemental Regulations, A. Regulations for All Districts, 12. Flood Prevention (pp. 62-63). Retrieved 6/1/18 from [http://www.ancramny.org/ws/wp-content/uploads/2017/10/Final\\_Zoning\\_Law\\_Nov\\_20\\_2014.pdf](http://www.ancramny.org/ws/wp-content/uploads/2017/10/Final_Zoning_Law_Nov_20_2014.pdf)

<sup>14</sup> *Floodplain Facts #11: Development in Areas of Shallow Flooding*. (2009). Southern Tier Central Regional Planning and Development Board. Retrieved 6/1/18 from [http://www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/Floodplain%20Management/NFIP\\_11\\_Areas\\_of\\_Shallow\\_Flooding.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/Floodplain%20Management/NFIP_11_Areas_of_Shallow_Flooding.pdf)

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<sup>17</sup> Town of Greenfield (NY) Municipal Code, Chapter 105: Zoning, Article X: Overlay District Requirements, Section 105-112 Floodplain Management, Wetland Resource Conservation Overlay District (FMWRC). Retrieved 6/1/18 from <http://ecode360.com/8221936>

<sup>18</sup> Definition from Chapter 2.06 of the New Hampshire Department of Environmental Services, *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development*. (2008). Retrieved 11/16/18 from [https://www.des.nh.gov/repp/innovative\\_land\\_use.htm](https://www.des.nh.gov/repp/innovative_land_use.htm)

<sup>19</sup> Jones, Christopher. (2017). *Flood Resistance of the Building Envelope*. National Institute of Building Sciences. Retrieved 6/1/18 from [https://www.wbdg.org/resources/env\\_flood.php](https://www.wbdg.org/resources/env_flood.php)

<sup>20</sup> The Department of State provide documents on its website relating to Uniform Code – Executive Law §379, including a “Code Outreach Program - More Restrictive Construction Standards” at [https://www.dos.ny.gov/DCEA/pdf/2018-3\\_More\\_Restrictive\\_Construction\\_Standards.pdf](https://www.dos.ny.gov/DCEA/pdf/2018-3_More_Restrictive_Construction_Standards.pdf) and a form called “Notice and Petition Relating to

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More Restrictive Construction Standards” at [https://www.dos.ny.gov/DCEA/pdf/Notice %20and Petition 379.pdf](https://www.dos.ny.gov/DCEA/pdf/Notice%20and%20Petition%20379.pdf).

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<sup>22</sup> Village of Freeport, Local Law 3 of 2013. Retrieved 6/1/18 from [http://locallaws.dos.ny.gov/sites/default/files/drop\\_laws\\_here/ECMMDIS\\_appid DOS20150218075529\\_42/Content/090213438000a4a2.pdf](http://locallaws.dos.ny.gov/sites/default/files/drop_laws_here/ECMMDIS_appid_DOS20150218075529_42/Content/090213438000a4a2.pdf)

<sup>23</sup> *No Adverse Impact: A Toolkit for Common Sense Floodplain Management*. (2003). Association of State Floodplain Managers. Retrieved 6/1/18 from [http://www.floods.org/NoAdverseImpact/NAI Toolkit 2003.pdf](http://www.floods.org/NoAdverseImpact/NAI_Toolkit_2003.pdf)

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<sup>27</sup> Town of Sherburne (NY) Intermunicipal Floodplain Management Agreement. (2013). Retrieved 6/1/18 from [http://www.townofsherburne.net/wp-content/uploads/Intermunicipal-Agreement-Floodplain.pdf? sm\\_au =iVVQ6JZ2jD5HJW7P](http://www.townofsherburne.net/wp-content/uploads/Intermunicipal-Agreement-Floodplain.pdf?sm_au=iVVQ6JZ2jD5HJW7P)

<sup>28</sup> Town of New Berlin (NY) Municipal Code, Chapter 91: Flood Damage Prevention, Article IV: Administration, Section 91-10. Retrieved 6/1/18 from <http://ecode360.com/9471540>

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<sup>30</sup> *Designing for Flood Levels Above the BFE After Sandy*. (2013) FEMA RA5. Retrieved 6/1/18 from [http://www.fema.gov/media-library-data/1381405016896-8bdeadf634c366439c35568a588feb24/SandyRA5DesignAboveBFE\\_508\\_FINAL2.pdf](http://www.fema.gov/media-library-data/1381405016896-8bdeadf634c366439c35568a588feb24/SandyRA5DesignAboveBFE_508_FINAL2.pdf)

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<sup>34</sup> *Designing for Flood Levels Above the BFE After Sandy*. (2013) FEMA RA5. Retrieved 6/1/18 from [http://www.fema.gov/media-library-data/1381405016896-8bdeadf634c366439c35568a588feb24/SandyRA5DesignAboveBFE\\_508\\_FINAL2.pdf](http://www.fema.gov/media-library-data/1381405016896-8bdeadf634c366439c35568a588feb24/SandyRA5DesignAboveBFE_508_FINAL2.pdf)

<sup>35</sup> *New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act*. Retrieved 6/26/18 from <https://www.dec.ny.gov/energy/102559.html>

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<sup>45</sup> *National Flood Insurance Program: Answers to Frequently Asked Questions About Increased Cost of Compliance*. (2017) FEMA P-1080. Retrieved 6/12/18 from [https://www.fema.gov/media-library-data/1506089264747-18aea311b4cffe2c738e3c56fccff18d/20170817\\_ICC\\_FAQs.pdf](https://www.fema.gov/media-library-data/1506089264747-18aea311b4cffe2c738e3c56fccff18d/20170817_ICC_FAQs.pdf)

<sup>46</sup> The \$30,000 in additional insurance coverage is available only up to the total limit of coverage under the National Flood Insurance Program. That limit is \$250,000 for a residential structure and \$500,000 for a non-residential structure. The total insurance claim plus the ICC claim may not exceed the above limits. *National Flood Insurance Program: Answers to Frequently Asked Questions About Increased Cost of Compliance*. (2017) FEMA P-1080. Retrieved 6/12/18 from [https://www.fema.gov/media-library-data/1506089264747-18aea311b4cffe2c738e3c56fccff18d/20170817\\_ICC\\_FAQs.pdf](https://www.fema.gov/media-library-data/1506089264747-18aea311b4cffe2c738e3c56fccff18d/20170817_ICC_FAQs.pdf)

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<sup>48</sup> Section 4: The Community's Role. *Increased Cost of Compliance Coverage - Guidance for State and Local Officials*. (2003). FEMA 301. Retrieved 11/16/18 from [https://www.fema.gov/media-library-data/20130726-1453-20490-7827/fema301\\_complete.pdf](https://www.fema.gov/media-library-data/20130726-1453-20490-7827/fema301_complete.pdf)

<sup>49</sup> Town of Huron (NY) Flood Damage Prevention Law, Section 2 Definitions. Retrieved 6/5/19 from [https://locallaws.dos.ny.gov/sites/default/files/drop\\_laws\\_here/ECMMDIS\\_appid\\_DOS20150728060040/Content/09021343800ee29b.pdf](https://locallaws.dos.ny.gov/sites/default/files/drop_laws_here/ECMMDIS_appid_DOS20150728060040/Content/09021343800ee29b.pdf)

<sup>50</sup> Enforcement of a cumulative substantial improvement provision could result in up to 110 credits toward flood insurance discounts in communities that participate in the CRS.

<sup>51</sup> Town of Huron (NY) Flood Damage Prevention Law, Section 2 Definitions. Retrieved 6/5/19 from

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[https://locallaws.dos.ny.gov/sites/default/files/drop\\_laws\\_here/ECMMDIS\\_appid\\_DOS20150728060040/Content/09021343800ee29b.pdf](https://locallaws.dos.ny.gov/sites/default/files/drop_laws_here/ECMMDIS_appid_DOS20150728060040/Content/09021343800ee29b.pdf)

<sup>52</sup> 6 NYCRR 502.4 Floodplain Management Criteria for State Projects in Flood Hazard Areas, Section (a)(17). Retrieved 6/1/18 from [https://govt.westlaw.com/nycrr/Document/I4eb109d4cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)](https://govt.westlaw.com/nycrr/Document/I4eb109d4cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))

<sup>53</sup> Town of Wappinger (NY) Municipal Code, Chapter 133 Flood Damage Prevention, Section 133-3 and 133-19. Retrieved 6/1/18 from <https://ecode360.com/11071675>

<sup>54</sup> Levees are regulated by 44 CFR 65.10 – Mapping of areas protected by levee systems. Retrieved 11/16/18 from <https://www.law.cornell.edu/cfr/text/44/65.10>

<sup>55</sup> Town of New Scotland (NY) Local Law 1-2015, A Local Law for Flood Damage Prevention. Retrieved 6/1/18 from <http://www.townofnewscotland.com/DocumentCenter/View/519/Flood-Damage-Prevention-2015-LL01>

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<sup>57</sup> City of New London, Outagamie and Waupaca Counties (WI), Municipal Code, Chapter 16: Floodplain Zoning Code, Section 16-10.0 Definitions. Retrieved 6/1/18 from [http://www.newlondonwi.org/Clerks/Municipal\\_Code/CHAPTER\\_16.pdf](http://www.newlondonwi.org/Clerks/Municipal_Code/CHAPTER_16.pdf)

<sup>58</sup> Unit 6: Additional Regulatory Measures. In *Managing Floodplain Development Through the NFIP*. (1998). Retrieved 6/1/18 from <http://www.fema.gov/media-library-data/20130726-1535-20490-3720/unit6.pdf>

<sup>59</sup> Ibid.

<sup>60</sup> *A Guide for Higher Standards in Floodplain Management*. (2013). ASFPM Floodplain Regulations Committee. Retrieved 6/13/18 from [https://www.floods.org/ace-files/documentlibrary/committees/3-13\\_Higher\\_Standards\\_in\\_Floodplain\\_Management2.pdf](https://www.floods.org/ace-files/documentlibrary/committees/3-13_Higher_Standards_in_Floodplain_Management2.pdf)

<sup>61</sup> Waukesha (WI) Municipal Code, Chapter 22 Zoning, Section 22.70 Floodplain Zoning. Retrieved 6/12/18 from <http://waukesha-wi.gov/DocumentCenter/View/664/2270-Floodplain-Zoning-PDF>

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<sup>62</sup> The NYS Department of Environmental Conservation Division of Water, Bureau of Flood Protection and Dam Safety is located at 625 Broadway, 4th Floor, Albany, NY 12233-3504. Contact them by email at [floodplain.floodplain@dec.ny.gov](mailto:floodplain.floodplain@dec.ny.gov) or by telephone at 518-402-8185.