

# Model Floodplain Overlay District Zoning Bylaw - Optional Higher Standards

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Model regulations developed by the Cape Cod Commission; Urban Harbors Institute at UMass Boston; Noble, Wickersham and Heart, LLP; and Cape Cod Cooperative Extension/WHOI Sea Grant on behalf of coastal communities.

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## Model Floodplain Overlay District Zoning Bylaw – Optional Higher Standards

*General Comment: These regulations are designed to be incorporated into a town's existing Floodplain Overlay District zoning bylaw. Provisions typically found in zoning bylaws, such as a purpose statement, are already included in these town bylaws. Towns need to ensure consistency between any provisions adopted below and their existing regulations.*

*This model bylaw offers the following a la carte concepts: addressing Historic Structures with more clarity than the State Building Code, measuring building height from Design Flood Elevation rather than ground level, limiting reconstruction after Substantial Damage to two times, using a Non-Conversion Agreement to ensure the space below Design Flood Elevation is not finished, limiting the storage of hazardous materials in the floodplain, addressing structures built on land removed from the floodplain with a Letter of Map Revision based on Fill; prohibiting new development and expansions in the V, Coastal A, and A Zones with limited exceptions, ensuring all new/Substantially Improved structures must be elevated to Design Flood Elevation in this bylaw or the State Building Code, whichever is higher; and creating a new Coastal Resilience Zone for areas beyond the FEMA Special Flood Hazard Area that are expected to experience flooding with sea level rise, as well as limited regulations to accompany this new zone.*

*These regulations are intended to be used in conjunction with the Coastal Resilience Bylaw. The Town, likely through the Conservation Commission if adopting the Coastal Resilience Bylaw, must adopt a model for Design Flood Elevation based on the Best Available Coastal Flooding Model and Target Year. These regulations focus on provisions that the Town may decide to change over time as new data and relevant information becomes available. Provisions that may change over time include the selection of the boundaries of the Coastal Resilience Zone as supported by the Best Available Coastal Flooding Model and Target Year, as well as the potential for adopting more stringent regulations as the Town experiences an increase in flooding.*

## **1. Preamble.**

Flooding can undermine and significantly damage buildings and development especially during heavy storms and flood events. Development in floodprone areas (including buildings, sheds, fences, walls, patios, decks and docks) can redirect or channelize flooding and increase flood volume and velocity, exacerbating erosion of and damage to neighboring natural resources, buildings, roads and other structures. Debris, building materials and hazardous materials washed into the flooded area can damage neighboring properties.

Towns must adopt floodplain regulations which ensure compliance with minimum requirements of the National Flood Insurance Program (NFIP). Towns voluntarily participate in the NFIP, opting to enforce regulations within FEMA's designated floodplain in exchange for the availability of lower cost flood insurance provided by the federal government.

Most zoning by-laws and regulations limit flood protection measures to areas delineated on FEMA Flood Insurance Rate Maps ("FIRM") as Special Flood Hazard Areas (SFHA). The SFHA, identified on the FIRM as flood Zones A and V, are areas with 1% risk of flooding in any given year. FIRMs must be adopted by a town that participates in the NFIP to maintain compliance. However, FIRMs are developed based on observed prior flood conditions and fail to consider expected changes that will occur with sea level rise and increasingly intense storm events.

There is a need to expand floodplain regulations beyond the FEMA-designated floodplain boundaries both laterally and vertically as FEMA maps do not consider future conditions and quickly become outdated. As sea levels rise and storms become more frequent and unpredictable, there is an increased need to address development in floodprone areas with future conditions in mind. Models are now available which provide the best available data to understand flood risks beyond FEMA floodplains. These areas which extend beyond the FEMA floodplain lateral boundary are identified below as Coastal Resilience Zones. Note that towns MUST adopt the latest FEMA maps to remain compliant with the NFIP but can adopt additional Coastal Resilience Zones.

The current State Building Code only applies to the SFHA identified on the FIRM and may not adequately protect buildings and the neighboring properties from sea level rise and increased storm conditions. Structures built today have an anticipated useful life well beyond the static conditions identified in the FIRM and the State Building Code. As sea level rises and storm frequency and intensity increase, the FIRM will not reflect the full extent of flood risk; and the current State Building Code will no longer adequately protect buildings constructed under the outdated FIRMs. More structures will be subject to

coastal floods and more structures will exacerbate flood impacts and sustain significant damage during floods and storms. The model regulations below address building elevation for structures under the jurisdiction of the State Building Code. This does not create a conflict with the State Building Code because these zoning provisions regulate uses and dimensions of structures, while the State Building Code regulates construction means, methods and materials.

Adopting more stringent floodplain regulations may assist a town with implementing resilience provisions of their comprehensive plan, as well as other goals identified by a town to advance coastal resiliency and protect the community in a future with changed flood conditions.

*Comment: Towns can elect to include this preamble or omit it and include it in a separate guidance document.*

*Comment: As the State Building Code evolves, towns will need to ensure that the provisions below do not conflict with the State Building Code. Further, if towns adopt the Coastal Resiliency Bylaw within their Wetlands Regulations, all provisions adopted in that bylaw must be consistent with this bylaw.*

## **2. Definitions**

*Comment: These definitions are intended to be included with current definitions in the Town's floodplain bylaw for compliance with the National Flood Insurance Program (may be called Floodplain Overlay District and likely is within zoning) and can, at the Town's option, supersede any pre-existing definitions. Some of these terms are not included in this model bylaw, but are included here because they have slightly different definitions than current Town floodplain bylaws.*

**ACCESSORY STRUCTURE.** Structures that are on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure. For floodplain management purposes, accessory structures must be used for parking or storage, be small and represent a minimal investment by owners, and have low damage potential.

**COASTAL A ZONE.** That part of the coastal Special Flood Hazard Area where wave heights can reach between 1.5 and 3 feet during a base flood event. The Limit of Moderate Wave Action (LiMWA) line marks the inland limit of the Coastal A Zone. The Coastal Resilience Bylaw and Wetlands Bylaws may refer to this as the Moderate Wave Action (MoWA) Zone.

COASTAL RESILIENCE ZONE. Any land which is subject to any inundation caused by coastal storms up to and including that predicted to be caused by the 1% annual storm for the Target Year, as defined in the Town's Wetlands Regulations.

*Comment: This definition must be consistent with the definition in the Wetlands Regulations/Coastal Resilience Zone, if adopted.*

DESIGN FLOOD ELEVATION. The elevation of surface water resulting from inundation caused by sea level rise and coastal storms up to and including that predicted to be caused by the 1% annual storm for the Target Year, as defined by the Best Available Coastal Flooding Model, or the State Building Code, whichever is higher.

*Comment: For towns using the Massachusetts Coastal Flood Risk Model maps to define the Coastal Resilience Zone, the Design Flood Elevation incorporates an adequate estimate of future flood elevation and eliminates the need for additional freeboard. For towns using other models, it may be necessary to add freeboard requirements to achieve adequate flood protections.*

DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to building or other development, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials. [US Code of Federal Regulations, Title 44, Part 59] Development includes all New Construction and Substantial Improvement, as those terms are defined in this bylaw.

FOOTPRINT. The area defined by the horizontal dimensions of a pre-existing building of the space which the development currently occupies. It does not include decks, pools, tennis courts, and other hardscape.

HISTORIC STRUCTURE. Any structure that is:

- (a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(c) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or

(d) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

(1) By an approved state program as determined by the Secretary of the Interior or

(2) Directly by the Secretary of the Interior in states without approved programs.

[US Code of Federal Regulations, Title 44, Part 59]

HOUSEHOLD QUANTITIES. The storage of hazardous materials/waste in quantities less than the following limits:

(a) 275 gallons of oil on site at any time to be used for heating of a structure, or to supply an emergency generator

(b) 25 gallons or equivalent dry weight, total, of Hazardous material(s) on site at any time (excluding oil as classified in part (a))

(c) 55 gallons of Hazardous Waste generated at the Very Small Quantity Generator level as defined in Massachusetts Hazardous Waste Regulations (310 CMR 30.000) and accumulated or stored on-site at any time. [Cape Cod Regional Policy Plan Water Resources Technical Guidance, Definitions, WR-33]

NEW CONSTRUCTION. Structures for which the start of construction commenced on or after the effective date of the first floodplain management code, regulation, ordinance, or standard adopted by the authority having jurisdiction, including any subsequent improvements to such structures. *New construction includes work determined to be substantial improvement.* [Referenced Standard ASCE 24-14]

SPECIAL FLOOD HAZARD AREA. The land area subject to flood hazards and shown on a Flood Insurance Rate Map or other flood hazard map as Zone A, AE, A1-30, A99, AR, AO, AH, V, VO, VE or V1-30. [Base Code, Chapter 2, Section 202]

STRUCTURAL FILL. Fill that is used to support or elevate a building or a portion of a building above expected flood levels (Base or Design Flood Elevation). This does not include fill used for nature-based solutions, roads, or other infrastructure.

STRUCTURE. For floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. [US Code of Federal Regulations, Title 44, Part 59]

SUBSTANTIAL DAMAGE. Damage that has occurred as a result of any origin where the total cost of repairs is 50 percent or more of the structure's *assessed value* before the disaster occurred. This definition will apply to Historic Structures (as defined) to the extent feasible, provided that compliance with the bylaw shall not be required where it would preclude continued designation as a Historic Structure.

SUBSTANTIAL IMPROVEMENT. An improvement totaling 50 percent or more of the *assessed value* (rather than the market value) of the structure before the "start of construction" of the improvement. This definition will apply to Historic Structures (as defined) to the extent feasible, provided that compliance with the bylaw shall not be required where it would preclude continued designation as a Historic Structure.

*Comment: These definitions of Substantial Damage and Substantial Improvement are more stringent than what is in the State Building Code. The State Building Code and NFIP guidance allow for the use of assessed values as determinants of market value, but applicants have the option to acquire their own appraisal. NFIP guidance indicates that towns should be consistent in which method they choose; this allows for that consistency while being fair to all applicants since not all applicants have the means for an independent appraisal. If a town does not opt to include this definition, then the definition from the State Building Code must be included in these bylaws instead.*

SUBSTANTIAL MODIFICATION. A change in materials, permeability, location, or increase in extent.

*Comment: Towns may wish to add a percentage component to this, such as 50%, to be consistent with other "substantial" definitions.*

WATER-DEPENDENT USE. For the purpose of hazardous waste storage only: facilities that function solely when adjacent to water, requiring direct access to or location in tidal or inland waters, and therefore cannot be located away from said waters.

*Comment: This definition is intended to provide relief to facilities such as gas docks from the prohibition of the storage of hazardous materials in the Floodplain Overlay District.*

### **3. Warning and Disclaimer of Liability.**

The degree of flood protection and resilience design required by these regulations is based on current scientific and engineering considerations and best resilience practices. Larger and more frequent floods may occur. These regulations do not imply that areas or structures in compliance with the requirements and guidelines of these regulations will be free from flooding or flood damage. These provisions shall not create liability on the part of the Town of [NAME] or any officer or employee thereof for any flood damage that may result from reliance on these regulations, or from any administrative decision lawfully made thereunder.

### **4. Application of these provisions.**

The Floodplain Overlay District is herein established as an overlay district and it includes the following subareas: (a) all Special Flood Hazard Areas within [COMMUNITY NAME] designated as Zone A, AE, AH, AO, A99, V, or VE on the [COUNTY NAME] Flood Insurance Rate Map (FIRM) dated [FIRM DATE] issued by the Federal Emergency Management Agency (FEMA) for the administration of the National Flood Insurance Program, and (b) the Coastal Resilience Zone as established by the [BEST AVAILABLE FLOOD RISK MODEL FOR TARGET YEAR]. The exact boundaries of the subareas of the District described in clause (a) above shall be defined by the 1%-chance base flood elevations shown on the FIRM and further defined by the [COUNTY NAME] Flood Insurance Study (FIS) report dated [FIS DATE]. The FIRM and FIS report are incorporated herein by reference and are on file with the Town Clerk, Planning Board, Building Official, Conservation Commission and [OTHER]. The exact boundaries of the subareas of the District described in clause (b) above are delineated by the Coastal Resilience Zone. The Coastal Resilience Zone is incorporated herein by reference on [MAP TITLE] and is on file with the Town Clerk, Conservation Commission, and [OTHER, SUCH AS CAPE COD COMMISSION ONLINE VIEWER].

The Design Flood Elevation is determined by the 1% chance flood conditions shown on the [BEST AVAILABLE COASTAL FLOOD MODEL] for [TARGET YEAR]. In circumstances where the State Building Code elevation (FEMA's Base Flood Elevation plus freeboard) is higher, the higher elevation shall be considered the Design Flood Elevation.

### **5. General Permit Requirements.**



The following provisions apply in all zones in the Flood District Overlay:

1. **Historic Structures.** Historic Structures, as defined above, must meet all Substantial Improvement and repair of Substantial Damage requirements except those that may preclude the Historic Structure's historic designation. The initial permit application must propose a Historic Structure brought into full compliance with the Massachusetts State Building Code, 780 C.M.R., as amended and this bylaw; the Historic District Commission or Building Department with guidance from a Historic Preservation Specialist may request altered plans if full compliance would jeopardize the structure's qualifying historic designation. In the case that a Historic Structure is not brought into full compliance, alternative flood protection measures must be employed to bring the Historic Structure as close to compliance as is reasonably feasible.
2. **Building Height.** Within the Floodplain Overlay District, Building Height shall be measured from the Design Flood Elevation rather than from ground elevation.
3. **Cumulative Substantial Improvement/Damage: Substantial Damage and Substantial Improvements** are subject to cumulative costs. This period runs five (5) years prior to the issuance of any permit under consideration. All permits for related work for the same structure within a five-year period are considered a single improvement and/or repair. A project may not be phased or segmented to evade, defer or limit the applicability of these regulations.

*Comment: This can be changed to a number of years preferred by a town. This does not conflict with the building code, because it addresses timeframe rather than construction means, methods, or materials. In 2022, the Town of Bourne passed a two-year cumulative regulation without challenge from the Attorney General.*

4. **Reconstruction after Substantial Damage.** Within the Floodplain Overlay District, after Substantial Damage caused by flooding or erosion, the reconstruction of any Structure (as defined herein) shall not be permitted more than twice, except in the case of the reconstruction of a Historic Structure that complies with Section 5.1.
5. **No Habitable Uses below Design Flood Elevation.** For any Structure within the District with enclosed area greater than five (5) feet in height below the Design Flood Elevation (DFE), the enclosed area shall be unfinished and constructed of flood resistant materials, shall be used solely for storage, access to the building and/or parking, and shall never be used for human habitation or auxiliary activities such as recreation rooms, pool showers, or other related uses. The Town requires the applicant to enter into a Non-Conversion Agreement or other recordable instrument,

whereby, prior to the issuance of any Certificate of Occupancy, the foregoing restrictions on use shall be permanently made binding on the property in question.

6. Hazardous Materials Storage. Storage or processing of materials that are hazardous, flammable, or explosive within the Floodplain Overlay District are prohibited unless they meet the definition of Household Quantities (defined above) or are undertaken in connection with a water-dependent use, as defined herein, in which case they shall be flood-proofed with a permanent or deployable mechanism.

In a V Zone, storage tanks for any hazardous materials must meet elevation and anchoring requirements of 780 CMR, using the Design Flood Elevation as determined by this bylaw, and cannot be buried.

*Note: If a town applies this higher standard, Community Rating System credit applies but a town may wish to add a special permit that allows larger quantities that manages storage.*

7. In any area that has been removed from a floodplain via a Letter of Map Revision Based on Fill, any activity that constitutes New Construction, Substantial Improvements, or Substantial Modifications (as those terms are defined herein) must meet all provisions of this bylaw for the original, underlying flood zone and elevation and not the new LOMR-F floodplain elevation.

## **6. V Zone Permit Requirements**

No activity that constitutes a new structure, creation of buildable lots, New Construction, or expansion of gross floor area or footprint, except for 100 square feet to allow for the relocation of mechanical systems and other utilities onto or access to the elevated main floor, or other flood protection measures, shall be permitted within a V Zone. The applicant must demonstrate that any proposed retaining walls, fences, or other coastal hardened flood and erosion mitigation measures will not redirect or channelize floodwaters toward abutting properties except in situations where such systems are used for flood protection measures and will provide protection to all structures and development in the area. Such walls, fences, and other systems will only be approved under a Special Permit.

Anything stored underneath a structure in the V Zone shall be secured or relocated in advance of a flood.

Within V Zones, new impervious hardscape, including but not limited to pools, tennis courts, impervious patios, and equipment pads shall not be permitted. Substantial modifications to impervious hardscape, including but not limited to pools, tennis courts, patios, equipment pads, sidewalks, walkways, and staircases that existed on the effective date of this Floodplain Overlay District Bylaw shall not be permitted without a Special Permit from Zoning Board of Appeals.

In all V Zones, the lowest horizontal structural member and mechanical systems of all New Construction and Substantial Improvements or repair of Substantial Damage (as those terms are defined herein) shall be elevated to at least the Design Flood Elevation or the maximum elevation required by the Massachusetts State Building Code, 780 C.M.R., as amended, whichever is higher.

*Comment: If towns want to limit the size and scale of decks on elevated buildings, they may address that through lot coverage limitations. New decks are not considered an expansion of building footprint per the definition of "footprint." A town could adopt a maximum square footage for new deck areas allowed in the V Zone.*

Within V Zones, repair or replacement of pre-existing accessory structures shall not result in expansion; structures and their utilities shall be anchored, and must be elevated to meet State Building Code standards.

## **7. Coastal A/Moderate Wave Action (MoWA) Zone Permit Requirements**

No activity that constitutes a new structure, creation of buildable lots under this bylaw, New Construction, or expansion of gross floor area or footprint, except for 100 square feet to allow for the relocation of mechanical systems and other utilities above the Design Flood Elevation or access to the elevated main floor, or other flood protection measures shall be permitted within a Coastal A Zone.

*Comment: This is an option. Towns may not wish to prohibit new construction in their Coastal A Zones/MoWA Zones. For more information on acreage and areas affected by this zone, see the Cape Cod Commission's accompanying flood map viewer. If towns do opt to prohibit new construction in this zone and the Coastal Resilience Bylaw has been adopted, the Coastal Resilience Bylaw should be updated to reflect the same for consistency.*

The applicant must demonstrate that any proposed retaining walls, fences, or other coastal hardened flood and erosion mitigation measures will not redirect or channelize floodwaters toward abutting properties except in situations where such systems are used for flood protection measures and

will provide protection to all structures and development in the area. Such walls, fences, and other systems will only be approved under a Special Permit.

Anything stored underneath a structure in the Coastal A Zone shall be removed or secured in advance of a flood.

Within Coastal A Zones, new impervious hardscape, including but not limited to pools, tennis courts, impervious patios, and equipment pads shall not be permitted. Substantial modifications to impervious hardscape, including but not limited to pools, tennis courts, patios, equipment pads, sidewalks, walkways, and staircases that existed on the on the effective date of this Floodplain Overlay District Bylaw shall not be permitted without a Special Permit from Zoning Board of Appeals.

In all Coastal A Zones, the lowest horizontal structural member and mechanical systems of all New Construction and Substantial Improvements or repair of Substantial Damage (as those terms are defined herein) shall be elevated to at least the Design Flood Elevation or the maximum elevation required by the Massachusetts State Building Code, 780 C.M.R., as amended, whichever is higher.

*Comment: If towns want to limit the size and scale of decks on elevated buildings, they may address that through lot coverage limitations. New decks are not considered an expansion of building footprint per the definition of "footprint." A town could adopt a maximum square footage for new deck areas allowed in the Coastal A Zone.*

Within Coastal A Zones, the following requirements shall supersede the requirements for the A Zone: accessory structures shall not exceed 120 square feet in area; structures and their utilities shall be anchored and must be elevated to meet State Building Code standards.

*Comment: If the Town has opted to prohibit new construction and expansions in Coastal A Zones/MoWA Zones, new accessory structures may be included. If so, the size limitation should be removed from this provision and only the anchoring and elevation requirements would be applicable to replaced/repared accessory structures.*

## **8. A Zone/Minimum Wave Action (MiWA) Zone Requirements**

No activity that constitutes a creation of buildable lots, New Construction, or expansion of footprint (as those terms are defined herein), except for 100' square to allow for the relocation of mechanical systems and other utilities onto the main floor or other flood protection measures shall be permitted within an A Zone. Structures and other development may be relocated from the V or Coastal A Zone into the A Zone.

*Comment: This is an option. Towns may not wish to prohibit new construction in their A Zones/MiWA Zones. For more information on acreage and areas affected by this zone, see the Cape Cod Commission's accompanying flood map viewer. If Towns do opt to prohibit new construction in this zone and the Coastal Resilience Bylaw has been adopted, the Coastal Resilience Bylaw should be updated to reflect the same for consistency.*

*Comment: Towns may wish to add language to allow specific actions under a Special Permit, such as outdoor landscape features.*

The applicant must demonstrate that any proposed retaining walls, fences, or other coastal hardened flood and erosion mitigation measures will not redirect or channelize floodwaters toward abutting properties except in situations where such systems are used for flood protection measures and will provide protection to all structures and development in the area. Such walls, fences, and other systems will only be approved under a Special Permit.

In all A Zones, the first floor and mechanicals of all Substantial Improvements or repair of Substantial Damage (as those terms are defined herein) shall be elevated to at least the Design Flood Elevation provided or the maximum elevation required by the Massachusetts State Building Code, 780 C.M.R., as amended, whichever is higher.

Within the A Zone, accessory structures smaller than 200 square feet and their utilities shall be anchored and wet-floodproofed or elevated to meet State Building Code standards.

*Comment: This provision will only be relevant in Towns that allow structural fill in the A Zone/Minimum Wave Action Zone. Structural fill is currently prohibited in V Zones and will likely be prohibited in Coastal A Zones in the 10th Edition of the State Building Code.*

## **9. Coastal Resilience Zone**

*Comment: The Coastal Resilience Zone extends beyond the FEMA-designated floodplain. In order to remain in compliance with the National Flood Insurance Program and continue to allow access to flood insurance within town, towns must adopt the official FEMA floodplain. If they wish to also adopt the Coastal Resilience Zone, that must be in addition to the FEMA floodplain. Towns must always adopt the latest FEMA maps at a*

*minimum.*

Within the Coastal Resilience Zone, all applicable requirements shall apply as described in Sections 6, 7, and 8 of this bylaw, and in any other local, state, or federal regulations as they pertain to the District. For areas of the District within the Coastal Resilience Zone that are not regulated under Sections 6, 7, and 8, the first floor and mechanical systems of all New Construction, Substantial Improvements, and repair of Substantial Damage (as those terms are defined herein) shall be elevated to at least the Design Flood Elevation provided or the maximum elevation required by the Massachusetts State Building Code, 780 C.M.R., as amended, whichever is higher.

The applicant must demonstrate that any proposed retaining walls, fences, or other coastal hardened flood and erosion mitigation measures will not redirect or channelize floodwaters toward abutting properties except in situations where such systems are used for flood protection measures and will provide protection to all structures and development in the area. Such walls, fences, and other systems will only be approved under a Special Permit.