

# CEO Land Use Workshop

## January 2011

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[www.maine.gov/spo/flood](http://www.maine.gov/spo/flood)



# Floodplain Management Program Development Standards

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- ❑ Contained in Article VI of your ordinance (state model)
- ❑ Copy so you can follow along

# A. All Development

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## Shall be:

1. Adequately anchored to prevent floatation (excluding piers and docks), collapse or lateral movement of the development resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;



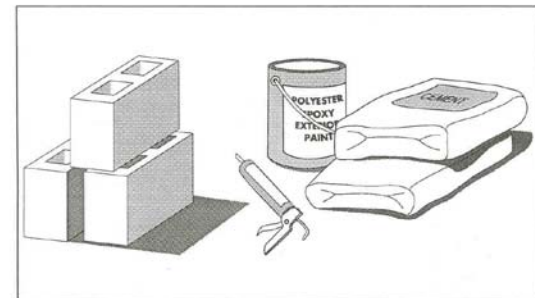
# All Development

2. Use construction materials that are resistant to flood damage.

NFIP Technical Bulletin  
2-93  
Flood Resistant  
Materials  
Requirements



Flood-Resistant Materials Requirements  
for Buildings Located in Special Flood Hazard Areas  
in accordance with the  
National Flood Insurance Program



FEDERAL EMERGENCY MANAGEMENT AGENCY  
FEDERAL INSURANCE ADMINISTRATION

FIA-TB-2  
4/93



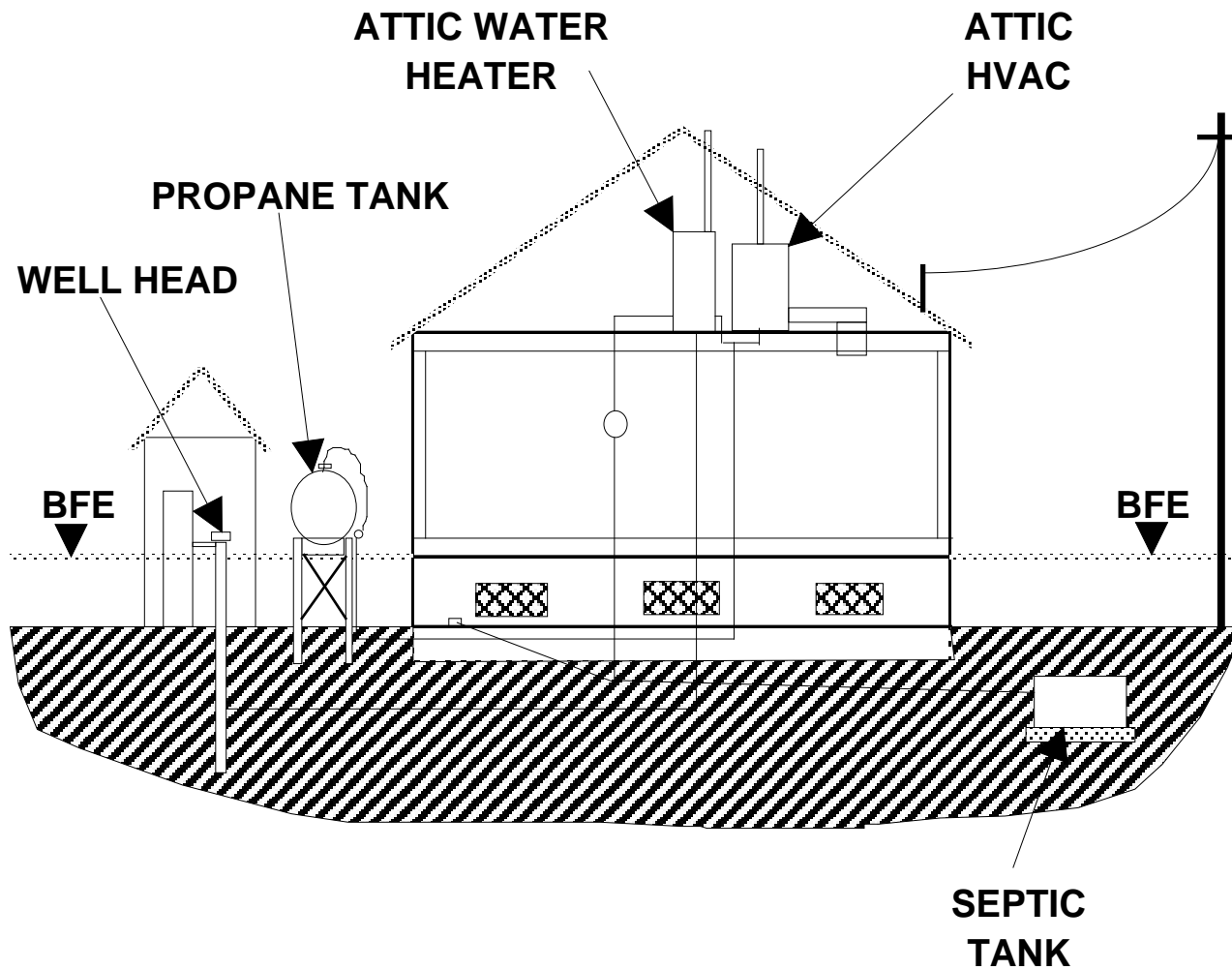
# All Development

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3. use construction methods and practices that will minimize flood damage;
4. use electrical, heating, ventilation, plumbing, and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during flooding conditions.



# UTILITY LOCATION SCHEMATIC





## B. Water Supply

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All new and replacement water supply systems shall be designed to minimize or eliminate infiltration for flood waters into the systems.

[seal the well, elevate well head]



## C. Sanitary Sewage Systems

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All new and replacement systems shall be designed to minimize or eliminate infiltration of flood waters into the systems





## D. On Site Waste Disposal Systems

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On site waste disposal systems shall be located and constructed to avoid impairment to them or contamination from them during floods.

## E. Water Course Carrying Capacity

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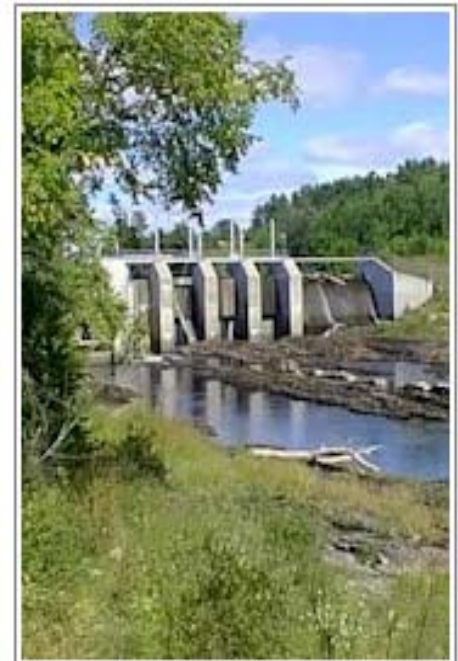
All development associated with altered or relocated portions of a watercourse shall be constructed and maintained in such a manner that no reduction occurs in the flood carrying capacity of the watercourse

Think dams, addition and removal

Relocation of a river as in Corinna superfund site

Fill

Floodway



DEP Photo



## F. Residential

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New construction and substantial improvements (of a structure) in **Zones A, A1-30, AE, and AH** shall have the Lowest Floor, including basement, elevated to at least 1 ft. above the BFE

# Structure

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"A walled and roofed building or a gas or liquid storage tank that is principally above ground."

Different meaning  
under SZ



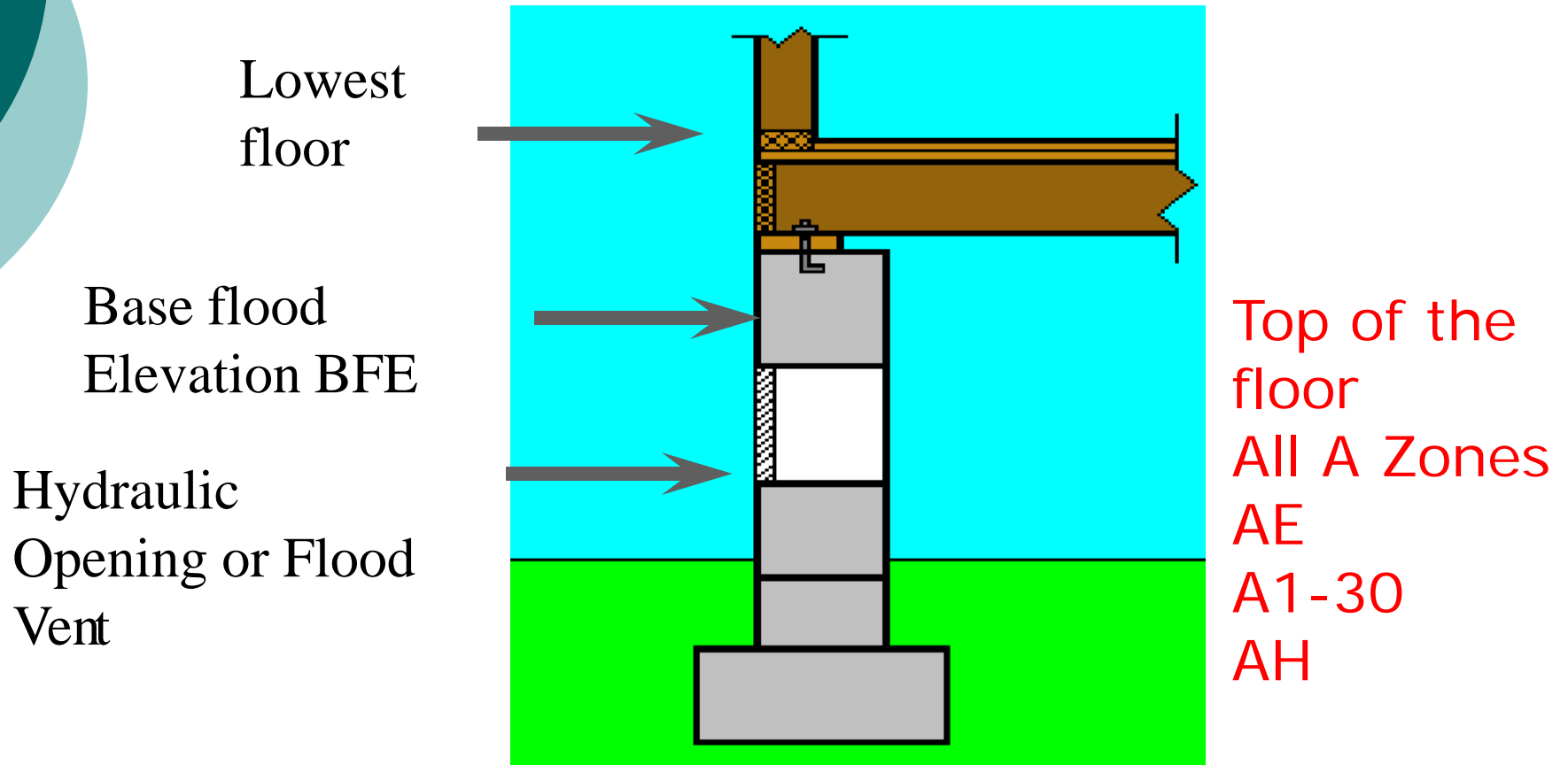


# Lowest Floor

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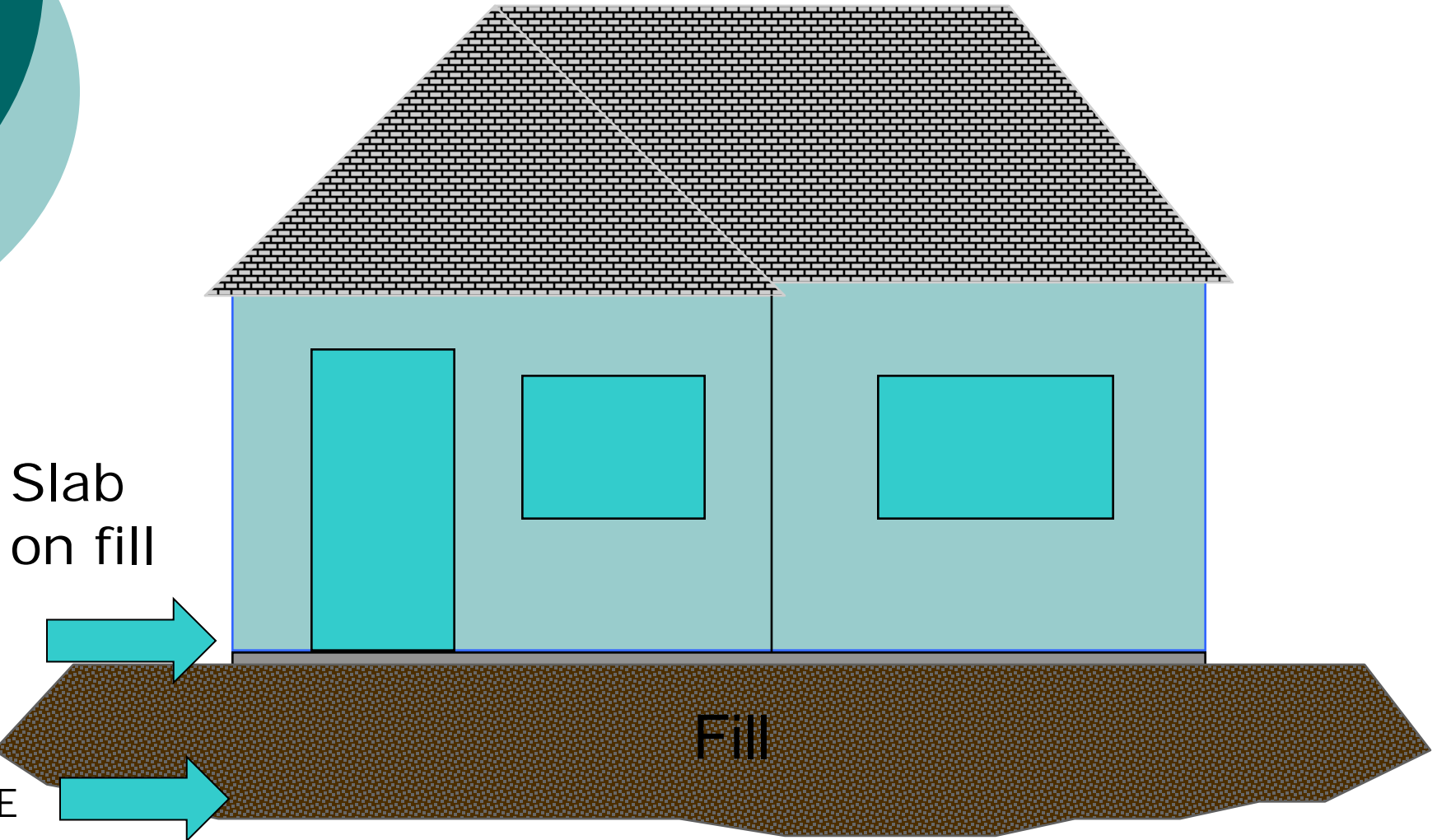
“the lowest floor of the lowest enclosed area (including basement).”

# Lowest Floor



# Elevation Options (A, A1-30, AE, & AH)

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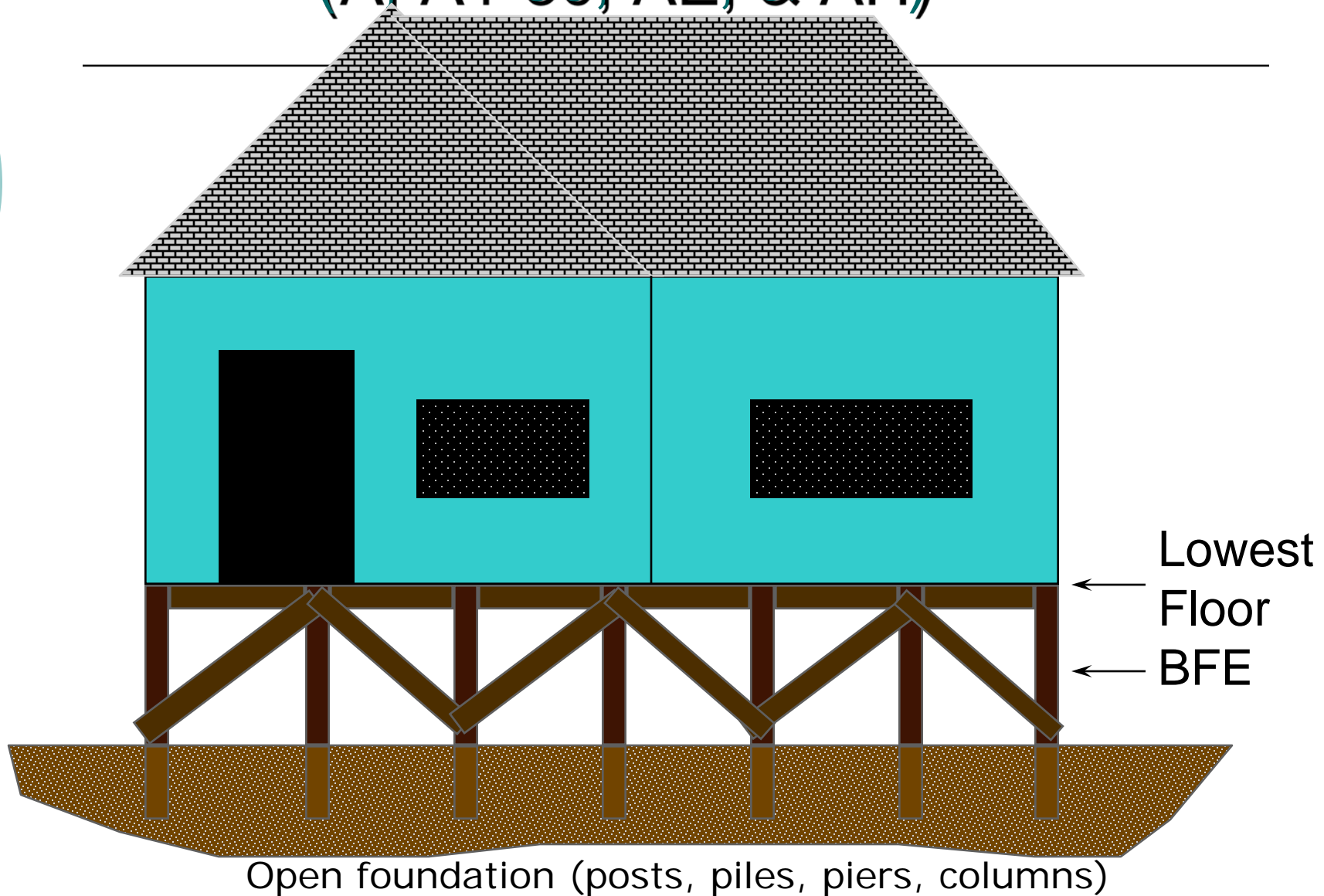








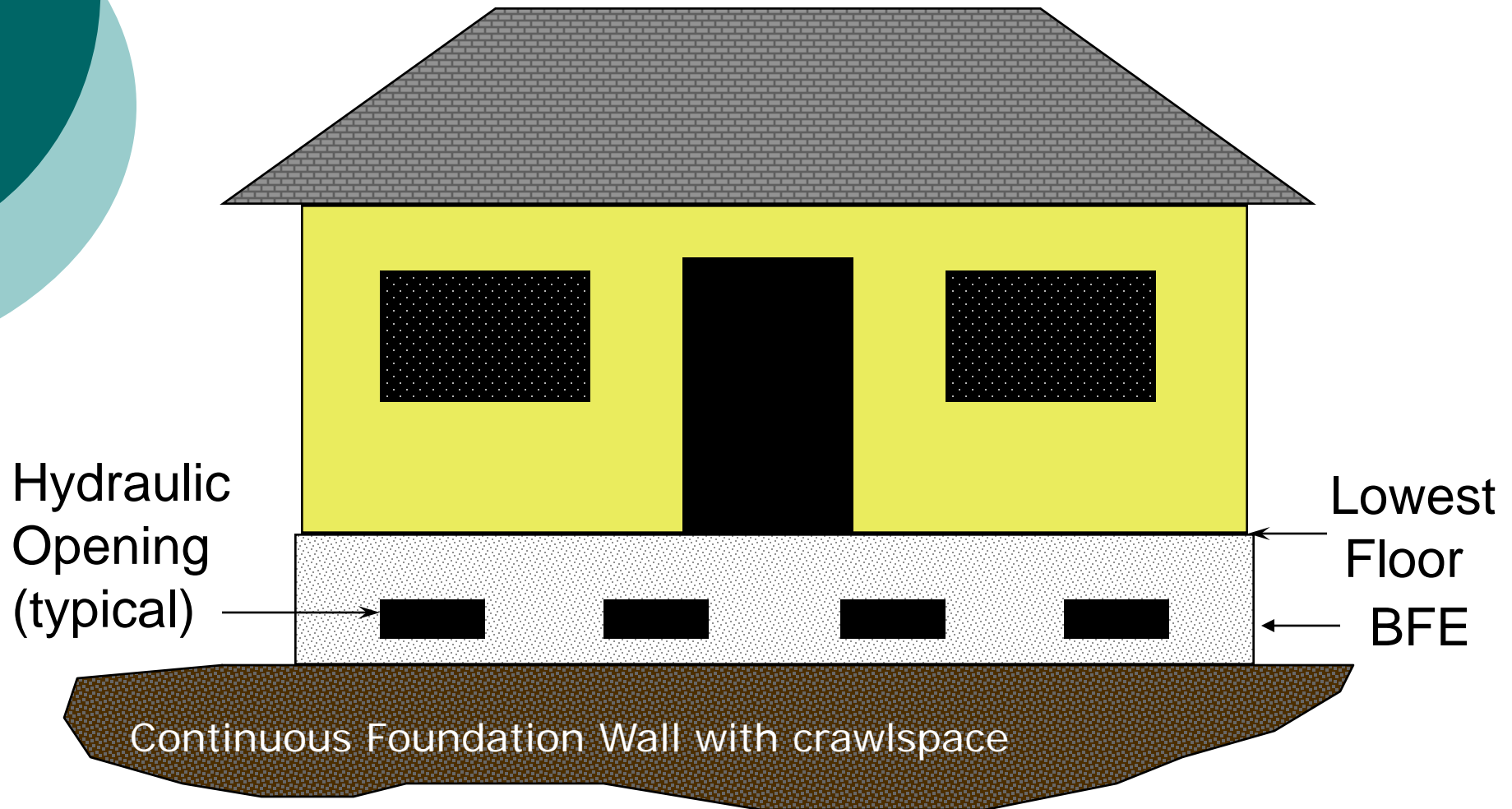
# Elevation Options (A, A1-30, AE, & AH)





# Elevation Options (A, A1-30, AE, & AH)

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# Hydraulic Openings/Flood Vents Zone A, A1-30, AE and AH

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New construction or substantial improvement of any structure that meets the development standards of Article VI, and is elevated on posts, columns, piers, piles, "stilts," or crawl spaces may be enclosed below the base flood elevation requirements provided all the following criteria are met or exceeded:





# Criteria for Hydraulic Openings

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1. Enclosed areas are not "basements" as defined in your ordinance;
2. Enclosed areas shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood water (openings-no human intervention).



# Criteria for Hydraulic Openings

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Designs for meeting this requirement must either:

a. be engineered and certified by a registered professional engineer or architect; or,

b. meet or exceed the following minimum criteria:

# Criteria for Hydraulic Openings (Default)

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1. a minimum of two openings having a total net area of not less than one square inch for every square foot of the enclosed area;
2. the bottom of all openings shall be below the base flood elevation and no higher than one foot above the lowest grade; and,
3. (3) openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the entry and exit of flood waters automatically without any external influence or control such as human intervention, including the use of electrical and other non-automatic mechanical means;



**This looks like 1  
foot or less.**







# Criteria for Hydraulic Openings

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



## Elevation (V1-30 and VE)

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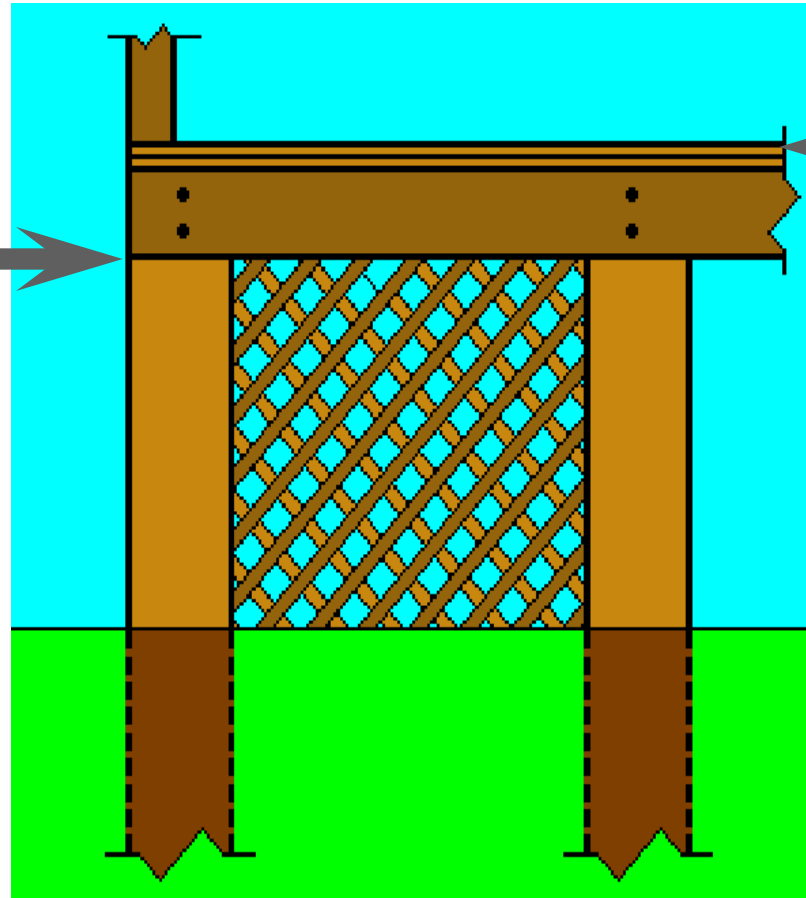
- The elevation reference level is different
- A Zones: Top of the lowest floor
- V Zones: Bottom of the “lowest horizontal member”

# Elevation Reference Level of Lowest Floor for Pile Foundations

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## V Zone

Bottom of  
lowest  
horizontal  
structural  
member  
supporting  
the lowest  
floor

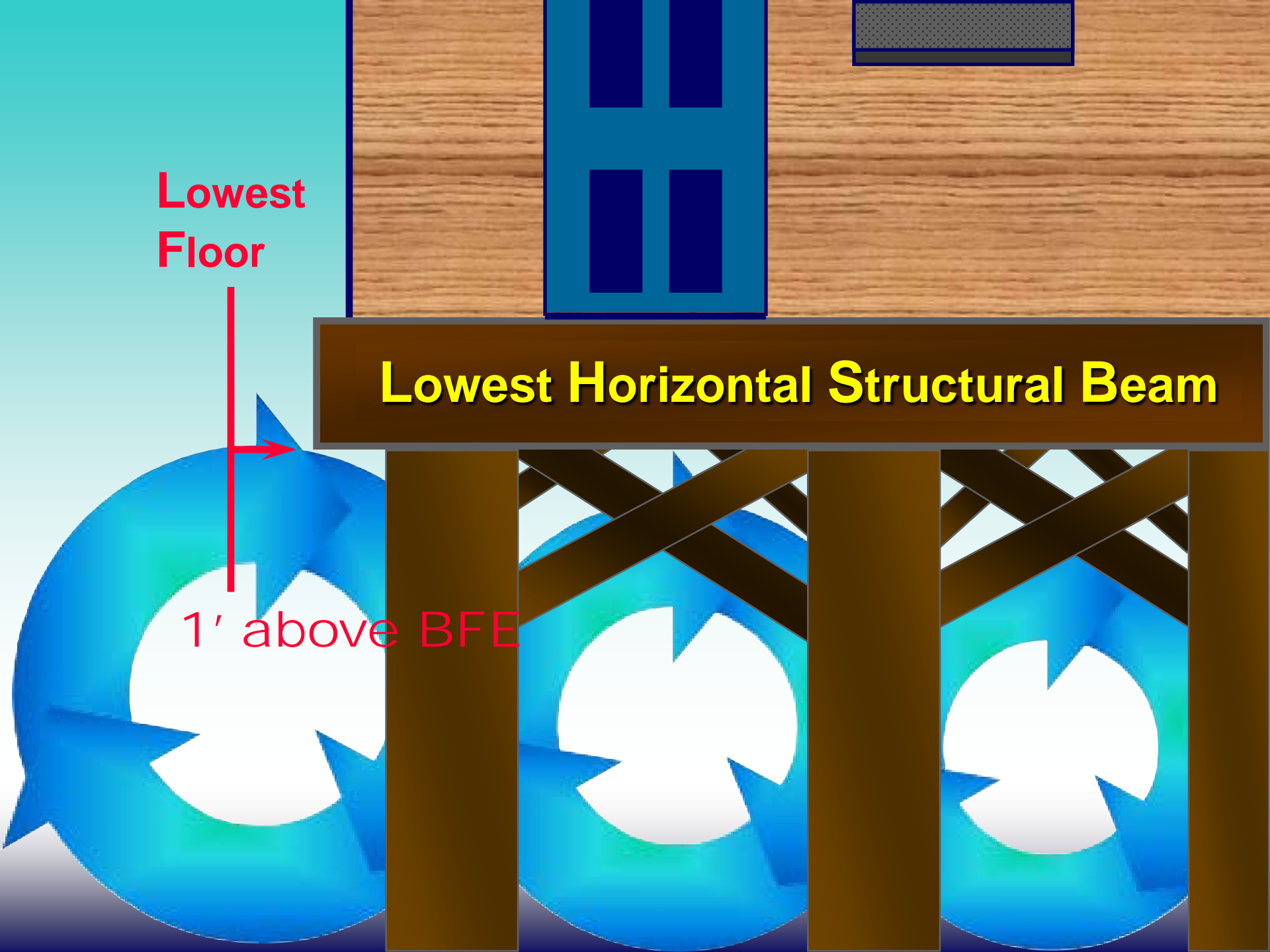



A Zone  
Top of the  
sub-floor

**Lowest  
Floor**

**Lowest Horizontal Structural Beam**

1' above BFE






# Requirements

## Zones V1-30 and VE

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Zones V1-30 and VE shall meet the requirements of Article VI.P.

Coastal Floodplains  
(also applies to coastal A  
Zones)



## Zones V1-30 and VE

### New Construction or Substantial Impr.

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- shall be located landward of the reach of mean high tide except as provided in Article VI.P.6.

(special criteria for lobster and fishing sheds only over water)


# Zones V1-30 and VE

## New Construction or Substantial Impr.

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Be elevated on posts or columns such that:

- (1) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to one foot above the base flood elevation;
- (2) the pile or column foundation and the elevated portion of the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the effects of wind and water loads acting simultaneously on all building components; and,
- (3) water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable state and local building standard



# Zones V1-30 and VE


## New Construction or Substantial Improve

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Have the space below the lowest floor:

- 1) free of obstructions; or,
- 2) constructed with open wood lattice-work, or insect screening intended to collapse under wind and water without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting piles or columns; or,
- 3) (3) constructed with non-supporting breakaway walls that have a design safe loading resistance of not less than 10 or more than 20 pounds per square foot.






# Zones V1-30 and VE

## New Construction or Substantial Impr.

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Require a registered professional engineer or architect to:

- 1) develop or review the structural design, specifications, and plans for the construction, which must meet or exceed the technical criteria contained in the Coastal Construction Manual, (FEMA-55/June, 2000); and,
- 2) certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the criteria of Article VI.P.2.



## Zones V1-30 and VE

### New Construction or Substantial Impr.

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- The use of fill for structural support in Zones V1-30 and VE is prohibited.
- Human alteration of sand dunes within Zones V1-30 and VE is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.
- The area below the lowest floor shall be used solely for parking vehicles, building access, and storage.



# CONDITIONAL USE

## Lobster and Fishing Sheds Over Water

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- Can be seaward of mean high tide
- Can be exempt from elevation req.
- Must have this section in your ordinance
- No deviations from model ordinance



# Manufactured Homes

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In Zones A, A1-30, AE, AH:

- Same 3 ways to elevate
- Adequately anchored to a permanent foundation
- Zone V1-30 or VE must meet coastal standards



# Non-Residential Structures Elevate or Dry Floodproof

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In Zones A, A1-30, AE, AH:

- Same 3 ways to elevate
- Dry Floodproof (PE Certification)

# Non-Residential Structures Dry Floodproof

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# Accessory Structures

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- In A Zones can be exempt from elevation requirements
- Must have the language in your ordinance
- Must meet VI.A.1-4; and
  - 1) be 500 square feet or less and have a value less than \$3000;
  - 2) have unfinished interiors and not be used for human habitation;

# Accessory Structures

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- 3) have hydraulic openings, as specified in Article VI.L.2., in at least two different walls of the accessory structure;
- 4) be located outside the floodway;
- 5) when possible be constructed and placed on the building site so as to offer the minimum resistance to the flow of floodwaters and be placed further from the source of flooding than is the primary structure; and,





# Accessory Structures

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- 6) have only ground fault interrupt electrical outlets. The electric service disconnect shall be located above the base flood elevation and when possible outside the Special Flood Hazard Area.

# Recreational Vehicles Defined

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A vehicle that is:

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

# Recreational Vehicles Standards

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## In A Zones:

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

# Recreational Vehicle Standards V Zones

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Must meet either:

the requirements of Article VI.I.1.a. **and** b.

(which means)

- a. be on the site for fewer than 180 consecutive days,
- b. be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; **or,**

Meet Article VI.P. standards for coastal construction

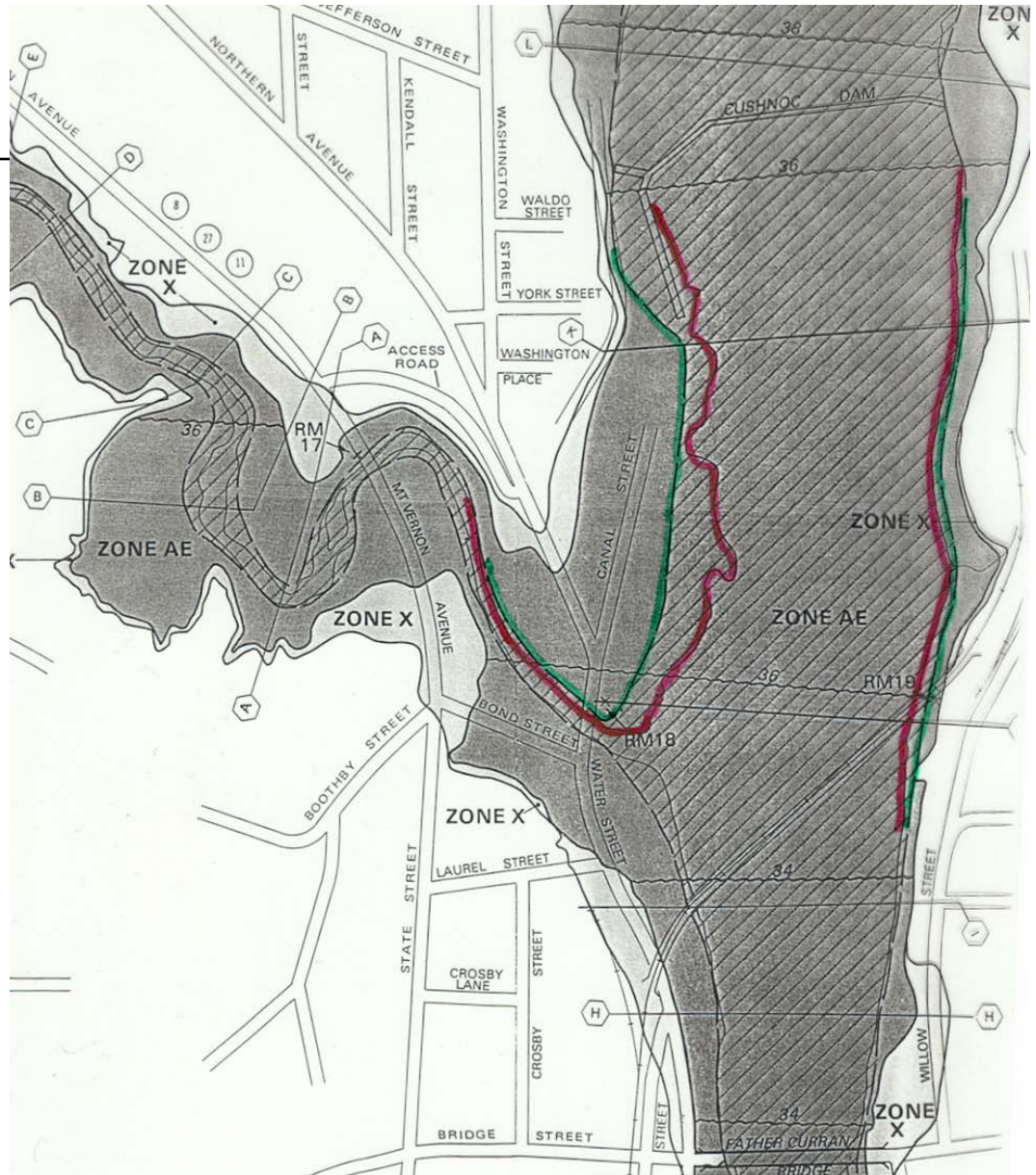


# Floodway

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- Channel and adjacent area needed to discharge the base flood
- Flood flow is most sensitive to changes brought by development
- Fast moving water
- All projects located in FWY must undergo additional encroachment review

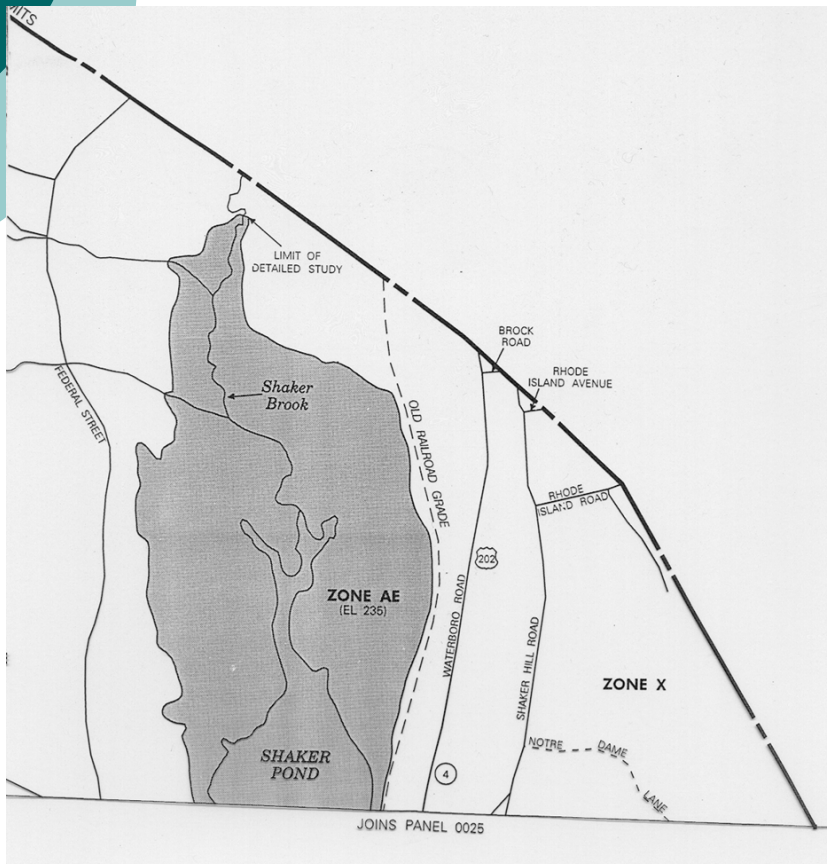
# Floodway



# Floodway Standard

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Is it a regulatory floodway  
(shown on a  
FIRM or FWY map)  
or not?





# Floodway Standard

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YES: No rise certification by a P.E.

NO: No more than a 1' rise

If no: default floodway is ½ the width of the floodplain on each side of the water body

Maine is more restrictive than the  
Feds!





# Floodways

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- Each project on a case by case basis
- Rely on a P.E.
- Guidance for minor projects (p5-23)

Filling

Excavation

Dams: Alterations,  
Construction, or Removal

Channel improvements: Bridges or culverts

**Why?**

Because these projects can have a significant impact on adjacent properties and up/down stream



# Zone AO

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- Coastal overwash zone/flow
- Uniform flood depth up to 3'
- Slightly different standards
- If you have AO or AH Zones on your map, the ordinance has the standards – have a project, call us



# Remember

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- States and communities can be more restrictive
- Maine requires 1' freeboard/2' in some
- Elevation Certificates can only be signed by PLS – PE – Architect
- Default floodway standards –  $\frac{1}{2}$  width of the floodplain
- Shoreland Zoning/RP District