780 CMR 120.G

FLOOD RESISTANT CONSTRUCTION AND CONSTRUCTION IN COASTAL DUNES

(Note: This Regulation is unique to Massachusetts)

780 CMR 120.G101 GENERAL

120.G101.1 General: All buildings and structures erected in areas prone to flooding and/or coastal dunes shall be constructed and elevated as required by the provisions of 780 CMR 120.G.

780 CMR 120.G201 DEFINITIONS

120.G201.1 Definitions. The following words and terms shall, for the purposes of 780 CMR 120.G, and as used elsewhere in 780 CMR, have the meanings shown in 780 CMR 120.G201.

A-Zones: A Zones are synonymous with Flood–Hazard Zones.

Base Flood Elevation: The flood having a 1% chance of being equaled or exceeded in any given year and shall be used to define areas prone to flooding, and describe at a minimum, the depth or peak elevation of flooding.

Basement/Cellar: Any area of the building having its floor subgrade (Below ground level) on all sides.

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

Coastal Dune: Any natural hill, mound or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash. Coastal Dune also means sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.

Coastal Wetland Resource Area: Any coastal wetland resource area subject to protection under M.G.L. c. 131, § 40 (the Wetlands Protection Act), and 310 CMR 10.21 through 10.35: *Coastal Wetlands*. Coastal Wetland Resource Areas include barrier beaches, coastal beaches, coastal dunes, rocky intertidal shores, tidal flats, land subject to 100 year coastal storm flowage, coastal banks, land containing shellfish, lands subject to tidal action, and lands under an estuary, salt pond or certain streams, ponds, rivers, lakes or creeks within the coastal zone that are anadromous/ catadromous fish runs.

Conservation Commission: Body comprised of members lawfully appointed pursuant to M.G.L. c. 40, § 8C. It shall also mean a mayor or board of selectmen, where no conservation commission has been established pursuant to M.G.L. c. 40, § 8C.

Determination of Applicability: A written finding by the issuing authority under M.G.L. c. 131, § 40 (the Wetlands Protection Act), as to whether a site or the work proposed therein is subject to jurisdiction under M.G.L. c. 131, § 40.

Elevation: The placement of a structure above flood level to minimize or prevent flood damages or to preserve the flood control and storm damage prevention functions of a coastal dune.

Failure of a Foundation: a foundation that is no longer supporting the building or foundation or is determined by the building official to be unsafe or incapable of continuing to support the building. For example, failure of a foundation occurs when a building or structure or portion thereof falls off the foundation or when the building official determines there is a risk that the building or structure may fall off the foundation.

Flood- Hazard Zones: Areas subject to a 1% or greater chance of flooding in any given year and that are not subject to wave heights in excess of three feet. (A ZONES).

Floodproofing: Any combination of structural and non-structural additions, changes or adjustments to structures which reduce or eliminate flood damage to new or substantially improved structures.

F.E.M.A.: Federal Emergency Management Agency.

Flood Insurance Rate Map: Flood insurance rate map (FIRM) means an official map of a community, which delineates both the special hazard zones and the risk premium zones applicable to the community.

High-hazard Zones (V Zones): Areas of tidal influence which have been determined to be subject to wave run heights in excess of three feet or subject to high-velocity wave run-up or wave-induced erosion (V Zones).

Highest Adjacent Grade: The highest natural elevation of the ground surface, prior to construction, adjoining the proposed foundation walls of a structure.

Impact Loads: Loads induced by the collision of solid objects on a structure carried by floodwater.

Interests Identified in M.G.L. c. 131, § 40 (the Wetlands Protection Act),: Public or private ground water supply, flood control, storm damage prevention, prevention of pollution, protection of land containing shellfish, protection of fisheries, and protection of wildlife habitat.

Issuing Authority under M.G.L. c. 131, § 40 (the Wetlands Protection Act): a conservation commission, mayor, the selectmen or the Department of Environmental Protection.

Lateral Addition: an addition that expands the footprint of a building or structure including a manufactured home.

Lowest Floor: The lowest floor of the lowest enclosed area (including basement/cellar). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or incidental storage in an area other than a basement/cellar with appropriate hydrostatic openings as required in 780 CMR 120.G501.4 is not considered a building's lowest floor.

Manufactured Home: A structure that is transportable in one or more sections, built on a permanent chassis, designed for use with or without a permanent foundation when attached to the required utilities, and constructed to the Federal Mobile Home Construction and Safety Standards and rules and regulations promulgated by the U.S. Department of Housing and Urban Development. The term also includes mobile homes, park trailers, travel trailers and similar transportable structures that are placed on a site for 180 days or longer. The term " manufactured home" does not include a "recreational vehicle".

Manufactured Housing: Manufactured Housing is synonymous with Manufactured Home.

Notification of Non-significance: A written finding by the issuing authority under M.G.L. c. 131, § 40 (the Wetlands Protection Act), that the area on which the proposed work is to be done or which the proposed work will alter is not significant to any of the interests identified in M.G.L. c. 131, § 40.

Order of Conditions: Written requirements by the issuing authority under M.G.L. c. 131, § 40 (the Wetlands Protection Act) establishing the manner in which work shall be done for work proposed within areas subject to jurisdiction under M.G.L. c. 131, § 40.

Order of Resource Area Delineation: Written findings by the issuing authority under M.G.L. c. 131, § 40 (the Wetlands Protection Act) identifying the boundaries of the area(s) subject to jurisdiction under M.G.L. c. 131, § 40.

Recreational Vehicle: A vehicle that is built on a single chassis 400 square feet or less when measured at the largest horizontal projection, designed to be self-propelled or permanently towable by a light duty truck, and designed primarily not for use as a permanent dwelling, but as temporary living quarters for recreational, camping, travel or seasonal use. A recreational vehicle is ready for highway use, if it is on wheels or a jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

Scouring: The erosion or washing away of slopes or soil by velocity waters.

Special Hazard Zones: An area having special flood, and/or flood-related erosion hazards and shown on Flood Hazard Boundary Map or FIRM as Zone A, AO, A1-30, AE, A99, AH, VO, V1-30, VE, V.

Start of Construction: The date the building permit was issued, provided the actual start of construction, repair, reconstruction, placement, or other improvement was within 180 days of the permit date. The actual start means the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation or the placement of a manufactured home on a foundation.

Structure (this definition is intended utilized with this 780 CMR 120.G): A walled and roofed building, including a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home.

Substantial Damage: Damage of any origin sustained by a building or structure including a manufactured home whereby the cost or restoring the building or structure to its before damaged condition would equal or exceed 50% of the market value of the building or structure before the damage occurred.

Substantial Improvements: Substantial improvement means any reconstruction, rehabilitation, addition, repair or improvement of a structure, the cost of which equals or exceeds 50% of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "Substantial damage", regardless of the actual repair work performed. Substantial improvement 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 codes 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."

Note 1: The following items can be excluded from the cost of improvement or repair: plans, specifications, survey, permits, and other items which are separate from or incidental to the repair of the damaged or improved building, *i.e.* debris removal/ cartage.

Note 2: The latest Assessors' structure value may be used, provided that the Assessors certify that said value is based on 100% valuation, less depreciation.

Substantial Repair of a Foundation: Work to repair and/or replace a foundation that results in the repair or replacement of the portion of the foundation walls with a perimeter along the base of the foundation that equals or exceeds 50% of the perimeter of the base of the entire foundation measured in linear feet. The term "substantial repair of a foundation" also includes a building or structure including a manufactured home that has incurred a failure of a foundation regardless of the actual work done to repair or replace the foundation.

V Zones: V Zones are synonymous with High-Hazard Zones.

Variance: A grant of relief by a community and the Commonwealth, via the Boards of Appeal, from the terms of the Floodplain Management Regulations.

Venting: A system designed to allow flood waters to enter an enclosure, usually the interior of foundations walls, so that the rising water does not create a dangerous differential in hydrostatic pressure; usually achieved through openings in the walls. Vents may be installed in garage doors to satisfy this requirement, provided such vents are installed consistent with 780 CMR 120.G. The necessity of human intervention, such as opening garage doors, does not satisfy this requirement.

780 CMR 120.G301 BASE FLOOD ELEVATION

120.G301.1 Base Flood Elevation. The base flood elevation shall be used to define areas prone to flooding, and shall describe, at a minimum, the depth or peak elevation of flooding (including wave height) which has a 1% (100-year flood) or greater chance of occurring in any given year

The 100-year flood elevation shall be determined as follows:

1. In A1-30, AH, AE, V1-30 and VE, the Base Flood Elevation is provided on the community's Flood Insurance Study and the Flood Insurance Rate Map (FIRM).
2. In AO zones, add the depth provided on the Flood Insurance Rate Map to the highest adjacent grade. If no depth is provided, add at least two feet to the highest adjacent grade.
3. In A, A99 and V zones, the building official, design professional, or surveyor shall obtain, review and reasonably utilize any Base Flood Elevation Data available from a federal, state or other reliable sources.

780 CMR 120.G401 HAZARD ZONES

120.G401.1 Hazard Zones. Areas which have been determined to have a 1% or greater chance of flooding in any given year shall be classified as either flood-hazard zones (A Zones) or high-hazard zones (V Zones) in accordance with 780 CMR 120.G501 and 120.G601.

780 CMR 120.G501 FLOOD HAZARD ZONES

120.G501.1 Construction in Flood-hazard zones (A Zones). All areas which have a 1% or greater chance of flooding in any given year but are not subject to wave heights in excess of three feet shall be designated as flood-hazard zones. Flood- hazard zones shall include all areas shown as A Zones on the most recent Flood Hazard Boundary Map or FIRM. All buildings and structures as defined in 780 CMR 120.G201 including new or replacement manufactured homes erected or substantially improved in flood-hazard zones shall be designed and constructed in accordance with 780 CMR 120.G501.

Plans for the construction or substantial improvement of a building or structure, including a new or replacement manufactured home, in a flood-hazard zone shall be prepared by a qualified registered professional engineer or architect to ensure the compliance with 780 CMR 120.G501.

Exception: If a substantial improvement consists exclusively of a lateral addition that does not rely on the support of the existing structure, only the lateral addition must be erected in accordance with the applicable provisions of 780 CMR 120.G501. In that event, the existing structure is not required to come into compliance with 780 CMR 120.G501.

Note: If located in a coastal dune that is significant to flood control and/or storm damage prevention, a building or structure, including a new or replacement manufactured home, in a flood-hazard zone shall be designed and constructed in accordance with the applicable provisions of 780 CMR 120.G701, and 120.G801 as well as 780 CMR 120.G501.

120.G501.2 Elevation in a Flood-hazard Zone. Except as otherwise provided in 120.G501, all buildings or structures, including new or replacement manufactured homes, erected or substantially improved within a flood-hazard zone shall be elevated so that the lowest floor is located at or above the base flood elevation. All basement/

cellar floor surfaces shall be located at or above the base flood elevations.

Exception: Floors of occupancy in any use group, other than use group R, below the base flood elevation shall conform to 780 CMR 120.G501.5.2. Floors of occupancies in any use group which are utilized solely for structure means of egress, incidental storage garages and parking, and which are located below the base flood elevation, shall conform to 780 CMR 120.G501.4.

120.G501.3 Anchorage in a Flood-hazard Zone. The structural systems of all buildings or structures, including new or replacement manufactured homes, shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the base flood elevation and shall be designed in accordance with 780 CMR 1615.2 and 1615.3.

120.G501.4 Enclosures below Base Flood Elevation in a Flood-hazard Zone. Enclosed spaces below the base flood elevation shall not be used for human occupancy with the exception of structural means of egress, entrance foyers, stairways and incidental storage. Fully enclosed spaces shall be designed to equalize automatically hydrostatic forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement shall either be certified by a registered design professional in accordance with 780 CMR 120.G501.11 through 120.G501.13 or conform to the following minimum criterion: a minimum of two openings having a total net area of not less than one square inch (645 mm^2) for every one square foot (0.1 m^2) of enclosed area subject to flooding shall be provided. The bottom of all openings shall not be higher than 12 inches (305 mm) above grade immediately adjacent to the location of the opening. Openings shall not be equipped with screens, louvers, valves or other coverings or devices unless such devices permit the automatic entry and discharge of floodwaters.

120.G501.5 Water-resistant Construction in a Flood-hazard Zone. Occupancies in any use group other than Use Group R may, in lieu of meeting the elevation provisions of 780 CMR 120.G501.2 be erected with floors usable for human occupancy below the base flood elevation provided that the following conditions are met:

1. All space below the base flood elevation shall be constructed with walls and floors that are substantially impermeable to the passage of water.
2. All structural components subject to hydrostatic and hydrodynamic loads and stresses during the occurrence of flooding to the base flood elevation shall be capable of resisting such forces, including the effects of buoyancy.
3. All openings below the base flood elevation shall be provided with water-tight closures and shall have adequate structural capacity to support all flood loads acting upon the closure surfaces.
4. All floor and wall penetrations for plumbing, mechanical and electrical systems shall be made water tight to prevent floodwater seepage through spaces between the penetration and wall construction materials. Sanitary sewer and storm drainage systems that have openings below the base flood elevation shall be provided with shutoff valves or closure devices to prevent backwater flow during conditions of flooding.

120.G501.6 Repair or Replacement of Existing Foundations in a Flood-hazard Zone. Existing foundations in a flood-hazard zone may be repaired without further compliance with 780 CMR 120.G501, unless the work replaces the foundation in total, replaces the foundation so as to constitute new construction or constitutes a substantial repair of a foundation as defined in 780 CMR 120.G201. In such events, the foundation shall be brought into compliance with the applicable provisions of 780 CMR 120.G501.

See Note 780 CMR 120.G501.1.

120.G501.7 Protection of Mechanical and Electrical Systems in a Flood-hazard Zone. New and replacement electrical, heating, ventilating, air conditioning and other service equipment in a flood-hazard zone shall either be placed above the base flood elevation or protected so as to prevent water from entering or accumulating within the system components during floods up to the base flood elevation in accordance with the mechanical code listed in 780 CMR 100.0 Installation of electrical wiring and outlets, switches, junction boxes and panels below the base flood elevation shall conform to the provisions of 527 CMR 12.00 listed in 780 CMR 100.0 for location of such items in wet locations. Duct insulation subject to water damage shall not be installed below the base flood elevation.

120.G501.8 Construction Materials, Methods, and Practices in a Flood-hazard Zone. All buildings or structures, including new or replacement manufactured homes, erected in a flood-hazard zone shall be constructed with materials resistant to flood damage and be constructed by methods and practices that minimize flood damage. Construction materials shall be resistant to water damage in accordance with the provisions of 780 CMR 1808.0, 1810.2, 1813.4, 2307.2, 2309.1, 2311.4, 2311.6, and 2503.4.

120.G501.9 Recreational Vehicles in a Flood-hazard Zone. All recreational vehicles placed in a flood-hazard zone and that are not fully licensed and ready for highway use or that are to be placed on a site for more than 180 consecutive days shall comply with the provisions of 780 CMR 120.G501 applicable to buildings or structures, including new or replacement manufactured homes.

120.G501.10 Alterations, Renovation and Repairs in a Flood-hazard Zone. Alterations, renovations and repairs to existing buildings and structures including new or replacement manufactured homes located in a flood-hazard zone shall comply with applicable provisions of 780 CMR. Compliance with 780 CMR 120.G501 is required whenever such alteration, renovation or repair constitutes a substantial repair of a foundation as defined in 780 CMR 120.G201, repair or replacement of a foundation that requires compliance with 780 CMR 120.G501, or a substantial improvement as defined in 780 CMR 120.G201.

120.G501.11 Certifications and Plans for Construction in a Flood-hazard Zone. Certifications and plans shall be submitted in accordance with 780 CMR 120.G501.12 and 120.G501.13 for a substantial repair of a foundation as defined in 780 CMR 120.G201, repair or replacement of a foundation that requires compliance with 780 CMR 120.G501, a substantial improvement as defined in 780 CMR 120.G201, or a building or structure as defined in 780 CMR 120.G201, including a new or replacement manufactured home.

120.G501.12 As-built Elevation Certification for Construction in a Flood-hazard Zone. For all substantial repairs of a foundation as defined in 780 CMR 120.G201, all repairs or replacement of a foundation that trigger the requirement to comply with 780 CMR 120.G501, all substantial improvements as defined in 780 CMR 120.G201, and all buildings or structures including new and replacement manufactured homes, a licensed land surveyor or registered design professional shall certify the actual elevation in relation to the base flood elevation of the lowest floor required to be elevated by the provisions of 780 CMR 120.G501.2. The certification required shall be submitted to the building official after the construction of the foundation is complete and before the commencement of any other work on the building or structure or, if there is no other work, the occupancy of the building or structure.

120.G501.13 Documentation -Water Resistant Construction in a Flood-hazard Zone. Where buildings or structures including new or replacement manufactured homes are to be constructed in accordance with 780 CMR 120.G501.5, the building official shall require that a registered design professional provide construction documents showing proposed details of floor, wall, foundation support components, loading computations, and other essential technical data used in meeting the conditions of 780 CMR 120.G501.5. The construction documents shall be accompanied by a statement bearing the signature of the registered design professional indicating that the design and proposed methods of construction are in accordance with applicable provisions of 780 CMR 120.G501.5.

780 CMR 120.G601 HIGH HAZARD ZONES

120.G601.1. Construction in High-hazard Zones (V Zones). Areas of tidal influence which have been determined to be subject to wave heights in excess of three feet (914 mm) or subject to high-velocity wave run-up or wave-induced erosion shall be classified as high- hazard zones. High-hazard zones shall include all areas shown as V Zones on the most recent Flood Hazard Boundary Map or FIRM. All buildings or structures as defined in 780 CMR 120.G201, including new or replacement manufactured homes, erected or substantially improved in a high-hazard zone shall be designed and constructed in accordance with 780 CMR 120.G601. All lateral additions of a building or structure in a high-hazard zone shall also be designed and constructed in accordance with 780 CMR 120.G601 whether or not the lateral addition constitutes a substantial improvement. Plans for a building, structure, substantial improvement, or lateral addition in a high-hazard zone shall be prepared by a registered professional engineer or architect to ensure compliance with 780 CMR 120.G601.

Note: If located in a coastal dune significant to flood control and/or storm damage prevention and a high-hazard zone, a building, structure, including a new or replacement manufactured home, a lateral addition, and a substantial improvement of a building or structure that has suffered substantial damage as a result of flooding or storms shall be designed and constructed in accordance with 780 CMR 120.G701 and 120.G801 as well as 120.G601.

120.G601.1.1 High-hazard Zone Construction Documents Requirements. Where buildings or structures are to be constructed in accordance with 780 CMR 120.G601, the building official shall require that a registered design professional provide construction documents showing proposed details of foundation support and connection components which are used in meeting the requirements of 780 CMR 120.G601.4. Where solid walls or partitions are proposed that are less than two feet above the base flood elevations, wall, framing and connection details of such walls shall be provided, including loading computations for the wall and foundation system used in meeting the conditions of 780 CMR 120.G601.3. The construction documents shall be accompanied by a statement bearing the signature of the registered design professional indicating that the design and proposed methods of construction are in accordance with all applicable provisions of 780 CMR 120.G601.