Part XII — Appendices

780 CMR 120.00

780 CMR 120.A

EMPLOYEE QUALIFICATIONS

(Note: *780 CMR 120.A is unique to Massachusetts*)

780 CMR 120.A101 BUILDING OFFICIAL QUALIFICATIONS.

120.A101.1 Inspector of Buildings/Building Commissioner. The requirements/qualifications for the inspector of buildings/building commissioner are set forth in M.G.L. c. 143, § 3, supplemented by 780 CMR 110.R7

120.A101.2 Building Inspector. The requirements/qualifications for the building inspector are set forth in M.G.L. c. 143, § 3, supplemented by 780 CMR 110.R7.

NON-TEXT PAGE

780 CMR 120.B

BOARD OF APPEALS

(Note: *780 CMR 120.B is unique to Massachusetts*)

780 CMR 120.B101 GENERAL

120.B101.1 Scope. Refer to M.G.L. c. 143, § 100 and 780 CMR 122.0 or 780 CMR 5122.0, as applicable, for requirements regarding appealing the interpretation, order, requirement, direction or failure to act by any state or local agency or any person or state or local agency charged with the administration or enforcement of the state building code or any of its rules and regulations, except for the specialized codes as described in M.G.L. c. 143, § 96.

NON-TEXT PAGE

780 CMR 120.C

GROUP U AGRICULTURAL BUILDINGS

780 CMR 120.C101 GENERAL

120.C101.1 Scope. The provisions of 780 CMR 120.C shall apply exclusively to agricultural buildings. Such buildings shall be classified as Group U and shall include the following uses:

1. Livestock shelters or buildings, including shade structures and milking barns.
2. Poultry buildings or shelters.
3. Barns.
4. Storage of equipment and machinery used exclusively in agriculture.
5. Horticultural structures, including detached production greenhouses and crop protection shelters.
6. Sheds.
7. Grain silos.
8. Stables.

780 CMR 120.C102 ALLOWABLE HEIGHT AND AREA

120.C102.1 General. Buildings classified as Group U Agricultural shall not exceed the area or height limits specified in Table 120.C102.1.

120.C102.2 One-story Unlimited Area. The area of a one-story Group U agricultural building shall not be limited if the building is surrounded and adjoined by public ways or yards not less than 60 feet (18288 mm) in width.

780 CMR 120.C103 MIXED OCCUPANCIES

120.c103.1 Mixed Occupancies. Mixed occupancies shall be protected in accordance with 780 CMR 3.00.

780 CMR 120.C104 EXITS

120.C104.1 Exit Facilities. Exits shall be provided in accordance with 780 CMR 10.00 and 11.00.

Exceptions:

1. The maximum travel distance from any point in the building to an approved exit shall not exceed 300 feet (91440 mm).
2. One exit is required for each 15,000 square feet (1393.5 m^2) of area or fraction thereof.

TABLE 120.C102.1 – BASIC ALLOWABLE AREA FOR GROUP U, ONE STORY IN HEIGHT AND MAXIMUM HEIGHT OF SUCH OCCUPANCY

I		II		III and IV		V	
A	B	A	B	IIIA and IV	IIIB	A	B
ALLOWABLE AREA (square feet)[a]							
Unlimited	60,000	27,100	18,000	27,100	18,000	21,100	12,000
MAXIMUM HEIGHT IN STORIES							
Unlimited	12	4	2	4	2	3	2
MAXIMUM HEIGHT IN FEET							
Unlimited	160	65	55	65	55	50	40

For SI: 1 square foot = 0.0929 m^2

a. See 780 CMR 120.C102 for unlimited area under certain conditions.

NON-TEXT PAGE

780 CMR 120.D

RESERVED

NON-TEXT PAGE

780 CMR 120.E

SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS

(Note: *780 CMR 120.E is unique to Massachusetts*)

780 CMR 120.E101 GENERAL

120.E101.1 Scope. For conformance to Massachusetts accessibility requirements refer to 521 CMR and 780 CMR 1007.

NON-TEXT PAGE

780 CMR 120.F

RODENT PROOFING

780 CMR 120.F101 GENERAL

120.F101.1 General. Buildings or structures and the walls enclosing habitable or occupiable rooms and spaces in which persons live, sleep or work, or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed in accordance with the provisions of 780 CMR 120.F101.

120.F101.2 Foundation Wall Ventilation Openings. Foundation wall ventilator openings shall be covered for their height and width with perforated sheet metal plates no less than 0.070 inch (1.8 mm) thick, expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick, cast iron grills or grating, extruded aluminum load-bearing vents or with hardware cloth of 0.035 inch (0.89 mm) wire or heavier. The openings therein shall not exceed ¼ inch (6.4 mm).

120.F101.3 Foundation and Exterior Wall Sealing. Annular spaces around pipes, electric cables, conduits, or other openings in the walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or noncorrosive metal.

120.F101.4 Doors. Doors on which metal protection has been applied shall be hinged so as to be free swinging. When closed, the maximum clearance between any door, door jambs and sills shall not be greater than ⅜ inch (9.5 mm).

120.F101.5 Windows and Other Openings. Windows and other openings for the purpose of light or ventilation located in exterior walls within two feet (610 mm) above the existing ground level immediately below such opening shall be covered for their entire height and width, including frame, with hardware cloth of at least 0.035 inch (0.89 mm) wire or heavier.

Note: For emergency escape windows, all screens and any security grid systems shall conform to the requirements of 780 CMR, 527 CMR (the State Fire Code) and the 105 CMR (State Sanitary Code) as applicable and such that emergency escape or fire department rescue efforts are not hindered.

120.F101.5.1 Rodent-accessible Openings. Windows and other openings for the purpose of light and ventilation in the exterior walls not covered in this chapter, accessible to rodents by way of exposed pipes, wires, conduits and other appurtenances, shall be covered with wire cloth of at least 0.035 inch (0.89 mm) wire. In lieu of wire cloth covering, said pipes, wires, conduits and other appurtenances shall be blocked from rodent usage by installing solid sheet metal guards 0.024 inch (0.61 mm) thick or heavier. Guards shall be fitted around pipes, wires, conduits or other appurtenances. In addition, they shall be fastened securely to and shall extend perpendicularly from the exterior wall for a minimum distance of 12 inches (305 mm) beyond and on either side of pipes, wires, conduits or appurtenances.

120.F101.6 Pier and Wood Construction.

120.F101.6.1 Sill less than 12 Inches above Ground. Buildings not provided with a continuous foundation shall be provided with protection against rodents at grade by providing either an apron in accordance with 780 CMR 120.F101.6.1.1 or a floor slab in accordance with 780 CMR 120.F101.6.1.2.

120.F101.6.1.1 Apron. Where an apron is provided, the apron shall not be less than eight inches (203 mm) above, nor less than 24 inches (610 mm) below, grade. The apron shall not terminate below the lower edge of the siding material. The apron shall be constructed of an approved nondecayable, water-resistant ratproofing material of required strength and shall be installed around the entire perimeter of the building. Where constructed of masonry or concrete materials, the apron shall not be less than 4 inches (102 mm) in thickness.

120.F101.6.1.2 Grade Floors. Where continuous concrete grade floor slabs are provided, open spaces shall not be left between the slab and walls, and openings in the slab shall be protected.

120.F101.6.2 Sill at or above 12 Inches above Ground. Buildings not provided with a continuous foundation and which have sills 12 or more inches (305 mm) above the ground level shall be provide with protection against rodents at grade in accordance with any of the following:

1. 780 CMR 120.F101.6.1.1 or 120.F101.6.1.2;
2. By installing solid sheet metal collars at least 0.024 inch (0.6 mm) thick at the top of each pier or pile and around each pipe, cable, conduit, wire or other item which provides a continuous pathway from the ground to the floor; or
3. By encasing the pipes, cables, conduits or wires in an enclosure constructed in accordance with 780 CMR 120.F101.6.1.1.

NON-TEXT PAGE

780 CMR 120.G

FLOOD RESISTANT CONSTRUCTION AND CONSTRUCTION IN COASTAL DUNES

(Note: *780 CMR 120.G 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.

120.G601.2 Elevation in a High-hazard Zone. All buildings or structures including new and replacement manufactured homes erected or substantially improved within a high-hazard zone shall be elevated so that the bottom of the lowest horizontal structural member supporting the lowest floor, with the exception of mat or raft foundations, piling, pile caps, columns, grade beams and bracing, is located at an elevation that is at least two feet above the base flood elevation. All lateral additions erected in a high- hazard zone shall also be elevated so that the lowest portion of all structural members supporting the lowest floor of the lateral addition with the exception of mat or raft foundations, pilings, pile caps, columns, grade beams and bracing shall also be located at an elevation that is at least two feet above the base flood elevation.

120.G601.3 Enclosures below Base Flood Elevation in a High-hazard Zone. All spaces that are less than two feet above the base flood elevation in a high-hazard zone shall not be used for human occupancy and shall be free of obstruction except as permitted in 780 CMR 120.G601.3:

1. Mat or raft foundations, piling, pile caps, bracing, grade beams and columns which provide structural support for the building.
2. Entrances and exits which are necessary for required ingress and means of egress.
3. Incidental storage of portable or mobile items readily moved in the event of a storm.
4. Walls and partitions are permitted to enclose all or part of the space below the elevated floor provided that such walls and partitions are not part of the structural support of the building and are constructed with insect screening, open wood lattice, or nonsupporting walls designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system due to the effect of wind loads as specified in 780 CMR 1611.0 and water loads as specified in 780 CMR 1615.0 acting simultaneously. Any such nonsupporting solid wall shall be certified as specified in 780 CMR 120.G601.10 and 120.G601.11.

120.G601.4 Foundations in a High-hazard Zone. All buildings or structures, including new and replacement manufactured homes, erected or substantially improved in high-hazard zones shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. All lateral additions in high-hazard zones shall also be supported on pilings or columns and shall be adequately anchored to such pilings or columns. The piling shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift) to which such piles are likely to be subjected during a flood to the base flood elevation. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile system design and installation shall also be made in accordance with the provisions of 780 CMR 1816.0 and 1817.0. Mat or raft foundations which support columns shall not be permitted where soil investigations required in accordance with 780 CMR 1802.1 indicate that soil material under the mat or raft is subject to scour or erosion from wave-velocity flow conditions.

120.G601.5 Repair or Replacement of Existing Foundations in a High-hazard Zone. Existing foundations may be repaired in a high-hazard zone without further compliance with 780 CMR 120.G. 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.G601.

See Note to 780 CMR 120.G601.1.

120.G601.6. Protection of Mechanical and Electrical Systems in a High-hazard Zone. New and replacement electrical equipment and heating, ventilating, air conditioning and other service equipment in a high- hazard zone shall be either placed at least two feet above the base flood elevation or protected so as to prevent water from entering or accumulating within the system components during floods in accordance with the mechanical code listed in 780 CMR 100.0. Installation of electrical wiring and outlets, switches, junction boxes and panels that are less than two feet above 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 be installed at least two feet above the base flood elevation.

120.G601.7. Construction Materials, Methods and Practices in a High-hazard Zone. All buildings or structures including new or replacement manufactured homes erected in high-hazard zones (V Zones) 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.G601.8 Recreational Vehicles in a High-hazard Zone: Recreational vehicles placed in a high-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.G601 applicable to buildings or structures including new or replacement manufactured homes.

120.G601.9 Alterations, Renovations and Repairs in a High-hazard Zone. Alterations, renovations and repairs to existing buildings, including manufactured homes, located in a high-hazard zone shall comply with all applicable provisions of 780 CMR. Compliance with 780 CMR 120.G. is required whenever such alteration, renovation or repair constitutes substantial repair of a foundation as defined in 780 CMR 120.G201, the repair or replacement of a foundation that requires compliance with 780 CMR 120.G601. as set forth in 780 CMR 120.G601.5, a substantial improvement as defined in 780 CMR 120.G201, or a lateral addition as defined in 780 CMR 120.G201.

120.G601.10 Certifications and Plans for Construction in a High-hazard Zone. Certifications and plans shall be submitted in accordance with 780 CMR 120.G601.10 and 120.G601.11 for a substantial repair of a foundation as defined in 780 CMR 120.G201, a repair or replacement of a foundation that requires compliance with 780 CMR 120.G601, a substantial improvement as defined in 780 CMR 120.G201, a lateral addition as defined in 780 CMR 120.G201, or a building, or structure, including a new and replacement manufactured home.

120.G601.11 As-built Elevation Certifications for Construction in a High-hazard Zone. For all substantial repairs of a foundation as defined 780 CMR 120.G201, all repairs or replacements of a foundation that trigger the requirement to comply with 780 CMR 120.G601, all substantial improvements as defined in 780 CMR 120.G201, all lateral additions as defined in 780 CMR 120.G201, and all buildings and 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 horizontal structural member required to be elevated by the provisions of 780 CMR 120.G601.2. The certification required herein 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.G701 COASTAL DUNES

120.G701.1 Determination of Coastal Dunes. To reduce flood damage, ensure the structural integrity of buildings or structures including manufactured homes, located in coastal dunes, to protect the public safety and to eliminate certain conflicts between the coastal dune performance standards set forth in the Wetlands Protection Act Regulations, 310 CMR 10.28, and this Code, 780 CMR 120.G701 and 120.G801 establish requirements for design and construction in coastal dunes significant to the interests of flood control and/or storm damage prevention identified in 310 CMR 10.28: *Coastal Dunes*.

To determine whether a proposed building or structure, including a manufactured home, a lateral addition, work on a foundation that under 780 CMR 120.G801.6 requires compliance with 780 CMR 120.G801,or substantial improvement to a building or structure that has incurred substantial damage as a result of flooding and/or storms is located within an area that is a coastal dune significant to the interests of flood control and/or storm damage prevention, the building official shall require the submission of certain construction documents in accordance with 780 CMR 120.G701.1.

120.G701.1.1 Submission of Construction Documents for Proposed Work in a Coastal Wetland Resource Area. For all buildings or structures, including new or replacement manufactured homes, all lateral additions, all work on a foundation that under 780 CMR 120.G801.6 requires compliance with 120.G801, and all substantial improvements of a building or structure that has incurred substantial damage as a result of flooding and/or storms proposed on a parcel of land that is located wholly or partially within a coastal wetland resource area shown on the map entitled "Map of Coastal Wetland Resources For Building Officials", the building official shall require submission of one of the construction documents specified in 780 CMR 120.G701.1.1(a) through (d) along with a notarized statement by the applicant that the Order, Determination or Notice is in effect and is not the subject of any administrative appeals before the Department of Environmental Protection or the Division of Administrative Law Appeals. No building permit shall issue unless and until a construction document that conforms to the requirements of 780 CMR 120.G701.1 including 120.G701.1(a) through (d) below is submitted.

(a) An Order of Conditions establishing the boundaries of all coastal wetland resource areas in a plan referenced in and accompanying the Order. The Order together with the plan referenced therein shall identify the boundaries of all coastal wetland resource areas including coastal dunes and determine whether the coastal wetland resource areas are significant to any of the interests identified in M.G.L. c. 131, § 40 (the Wetlands Protection Act) including the interests of flood control and storm damage prevention. If the Order of Condition and the plan referenced therein indicate that the proposed construction work is located within a coastal dune that is significant to the interests of flood control and/or storm damage prevention, the Order of Conditions must allow the proposed construction.

(b) An Order of Resource Area Delineation stating that the proposed construction work is outside the boundaries of all coastal wetland

resource areas as shown on a plan referenced in and accompanying the Order.

(c) A Determination of Applicability stating that the proposed construction work is outside the boundaries of all coastal wetland resource areas as shown on a plan referenced in and accompanying the Determination or will not fill, dredge or alter a coastal wetland resource area.

(d) A Notice of Non-significance evidencing that the proposed construction work is within a coastal wetland resource area as shown on a plan referenced in and accompanying the Notice and stating that the coastal wetland resource area is not significant to any of the interests identified in M.G.L. c. 131, § 40 (the Wetlands Protection Act).

120.G801 CONSTRUCTION IN COASTAL DUNES

120.G801.1 Requirements for Design and Construction in Coastal Dunes. All buildings and structures including manufactured homes, all lateral additions, all substantial improvements to a building or structure that has incurred substantial damage as a result of flooding and/or storms, and all work on a foundation that under 780 CMR 120.G801.6 requires compliance with 780 CMR 120.G801, that are proposed within an area that is a coastal dune significant to the interests of storm damage prevention and/or flood control shall comply with the provisions of 780 CMR 120.G801 including 120.G801.1 through 120.G801.11. The determination of whether such construction work is proposed to be located within an area that is a coastal dune significant to the interests of storm damage prevention and/or flood control shall be based solely on the construction documents submitted to the building official in accordance with 780 CMR 120.G701 including 120.G701.1.1(a) through (d). If the proposed construction work is also located in a flood-hazard zone or a high-hazard zone, the construction work shall also comply with applicable provisions of 780 CMR 120.G501 or 120.G601, as applicable.

Note 1: A lateral addition proposed to be constructed within a coastal dune that is significant to the interests of flood control and/or storm damage prevention shall be constructed in accordance with 780 CMR 120.G801.1 through 120.G801.11 whether or not the lateral addition is a substantial improvement as defined in 780 CMR 120.G201.

Note 2: A substantial improvement to a building or structure including a manufactured home, that is located in a coastal dune that is significant to the interests of flood control and/or storm damage prevention and that has not incurred substantial damage as a result of flooding or storms does not trigger the requirement that the existing building or structure be brought into compliance with 780 CMR 120.G801.1 through 120.G801.11.

Note 3: If located in a flood hazard-zone or a high hazard zone, a substantial improvement to a building or structure, including a manufactured home, in a coastal dune that is significant to flood control and/or storm damage prevention must comply with all applicable provisions of 780 CMR 120.G501 or 120.G601.

120.G801.2 Plans for Construction in a Coastal Dune. All plans for the construction of a building or structure including a new or replacement manufactured home and all plans for a lateral addition as defined in 780 CMR 120.G201, a substantial improvement of a building or structure that has incurred substantial damage as a result of flooding and/or storms, work on a foundation that under 780 CMR 120.G801.6 requires compliance with 780 CMR 120.G as applicable, proposed within an area that is a coastal dune significant to the interests of flood control and/or storm damage prevention shall be prepared by a registered professional engineer or architect to ensure compliance with 120.G801.3 through 120.G.8.11.

120.G801.3 Foundation Types in a Coastal Dune. All buildings, structures, or lateral additions, and substantial improvements to a building or structure that has incurred substantial damage as a result of storms and/or flooding that are located in a coastal dune significant to the interests of flood control and/or storm damage prevention shall be supported on open pilings without footings to allow the lateral movement of the dune and shall be adequately anchored to such pilings. The pilings shall have adequate soil penetration to resist the combined wave and wind loads (lateral and uplift) to which such piles are likely to be subjected during storm events. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile system design and construction shall be made in accordance with the provisions of 780 CMR 1816.0 and 1817.0.

Exception: Where surface or subsurface conditions consist of nonerodible soil that prevents the use of pile foundations, spread footing or mat foundations may be permitted provided they are anchored to prevent sliding, uplift or overturning to nonerodible soil with sufficient strength to withstand forces from the combinations of load.

Note: An Order of Conditions is required for the construction of a new foundation in a coastal dune that is significant to the interests of flood control or storm damage prevention. An Order of Conditions is also required for work on a foundation that under 780 CMR 120.G8.6 requires compliance with 780 CMR 120.G801. To allow the lateral movement of the dune, the Order of Conditions may impose

additional requirements or restrictions on the use of certain foundation types based on site-specific factors. All foundations in such a coastal dune must also be designed and constructed in accordance with the Order of Conditions.

120.G801.4 Elevation in a Coastal Dune. Within a coastal dune that is significant to the interests of flood control and/or storm damage prevention, all buildings or structures including new and replacement manufactured homes, all lateral additions as defined in 780 CMR 120.G201, and all substantial improvements of a building or structure that has incurred substantial damage as a result of flooding or storms shall be erected so that the bottom of the lowest horizontal structural member of the lowest floor with the exception of pilings or pile caps is located at the elevation required by the Order of Conditions.

Note: Orders of Conditions issued by a Conservation Commission may be appealed to the Massachusetts Department of Environmental Protection and the Division of Administrative Law Appeals by following the procedures set forth in 310 CMR 10.05(7).

120.G801.5 Recreational Vehicles in a Coastal Dune. Recreational vehicles placed in a coastal dune that is significant to the interests of flood control and/or storm damage prevention and that either are not fully licensed and ready for highway use or placed on the coastal dune for more than 180 consecutive days shall be designed and constructed in accordance with the requirements of 780 CMR 120.G801.1 through 801.11 applicable to buildings or structures including new or replacement manufactured homes.

120.G801.6 Repair or Replacement of Existing Foundations in a Costal Dune. Except as otherwise provided herein, existing foundations in a coastal dune significant to the interests of flood control and/or storm damage prevention may be repaired without further compliance with 780 CMR 120.G, as applicable. Existing foundation systems in a coastal dune significant to the interests of flood control and/or storm damage prevention, which are replaced in total, which are replaced so as to constitute new construction, or any substantial repair of a foundation as defined in 780 CMR 120.G201 shall trigger the requirement that the foundation be brought into compliance with the applicable provisions of 780 CMR 120.G801 including 780 CMR 120.G801.3 and 120.G801.4.

120.G801.7 Substantial Improvement of a Building or Structure, Including a Manufactured Home, That Is Located in a Coastal Dune and Has Suffered Substantial Damage.. All substantial improvements to a building or structure including a manufactured home that is located in a coastal dune that is significant to flood control and/or storm damage prevention, and that has incurred substantial damage as a result of flooding or storms shall be subject to the requirements in 780 CMR 120.G701 and 780 CMR 120.G801 applicable to buildings or structures including without limitation the elevation and foundation type requirements of 780 CMR 120.G801.3 and 120.G801.4.

120.G801.8 Protection of Mechanical and Electrical Equipment in a Coastal Dune. New and replacement electrical equipment, heating, ventilating, air conditioning and other service equipment in a coastal dune that is significant to the interests of flood control and/or storm damage prevention shall be placed at the elevation required by the Order of Conditions.

120.G801.9 Certifications and Plans for Construction in a Coastal Dune. Certifications and plans in accordance with 780 CMR 120.G801.10 and 120.G801.11 shall be submitted for the following construction work in a coastal dune significant to the interests of flood control and/or storm damage prevention: all work on a foundation that under 780 CMR 120.G801.6 requires compliance with 780 CMR 120.G801, all lateral additions as defined in 780 CMR 120.G201, all buildings or structures, including new and replacement manufactured homes, and all substantial improvements of a building or structure that has incurred substantial damage as a result of flooding and/or storms.

120.G801.10 As-built Elevation Certification for Construction in a Coastal Dune. After the construction of the foundation is complete and before the commencement of any other work on the building or structure including a new or replacement manufactured home, or if there is no other work, the occupancy of the structure, a licensed land surveyor or registered design professional shall submit certification to the building official that the actual elevation of the lowest horizontal structural member in relation to the elevation of the dune prior to the start of construction meets or exceeds the requirements of 780 CMR 120.G801.4.

120.G801.11 Coastal Dune Construction Documents. The building official shall require that the registered design professional provide construction documents showing details of foundation support and components, loading computations and other essential data demonstrating compliance with the requirements of 780 CMR 120.G801 including 120.G801.3 and 120.G801.4 for the following construction work in a coastal dune significant to the interests of flood control and/or storm damage prevention: all work on a foundation that under 780 CMR 120.G801.6 requires compliance with 780 CMR 120.G801, all lateral additions as defined in 780 CMR 120.G201, all buildings or structures as defined in 780 CMR 120.G201, including new and replacement

manufactured homes, and all substantial improvements of a building or structure that has incurred substantial damage as a result of flooding or storms. 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.G801 including 120.G801.3 through 120.G8

780 CMR 120.H

SIGNS

780 CMR 120.H101 GENERAL

120.H101.1 General. A sign shall not be erected in a manner that would confuse or obstruct the view of or interfere with exit signs required by Chapter 10 or with official traffic signs, signals or devices. Signs and sign support structures, together with their supports, braces, guys and anchors, shall be kept in repair and in proper state of preservation. The display surfaces of signs shall be kept neatly painted or posted at all times.

120.H101.2 Signs Exempt from Building Permits. The following signs are exempt from the requirements to obtain a permit before erection:

1. ***Paint-only*** nonilluminated signs.
2. Temporary signs announcing the sale or rent of property.
3. Signs erected by transportation authorities.
4. Projecting signs not exceeding 2.5 square feet (0.23 m^2).
5. The changing of moveable parts of an approved sign that is designed for such changes, or the repainting or repositioning of display matter shall not be deemed an alteration.

780 CMR 120.H102 DEFINITIONS

120.H102.1 General. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this appendix, have the meanings shown in 780 CMR 120.H102. Refer to 780 CMR 2.00 for general definitions.

COMBINATION SIGN. A sign incorporating any combination of the features of pole, projecting and roof signs.

DISPLAY SIGN. The area made available by the sign structure for the purpose of displaying the advertising message.

ELECTRIC SIGN. A sign containing electrical wiring, but not including signs illuminated by an exterior light source.

GROUND SIGN. A billboard or similar type of sign which is supported by one or more uprights, poles or braces in or upon the ground other than a combination sign or pole sign, as defined by 780 CMR.

POLE SIGN. A sign wholly supported by a sign structure in the ground.

PORTABLE DISPLAY SURFACE. A display surface temporarily fixed to a standardized advertising structure which is regularly moved from structure to structure at periodic intervals.

PROJECTING SIGN. A sign other than a wall sign, which projects from and is supported by a wall of a building or structure.

ROOF SIGN. A sign erected upon or above a roof or parapet of a building or structure.

SIGN. Any letter, figure, character, mark, plane, point, marquee sign, design, poster, pictorial, picture, stroke, stripe, line, trademark, reading matter or illuminated service, which shall be constructed, placed, attached, painted, erected, fastened or manufactured in any manner whatsoever, so that the same shall be used for the attraction of the public to any place, subject, person, firm, corporation, public performance, article, machine or merchandise, whatsoever, which is displayed in any manner outdoors. Every sign shall be classified and conform to the requirements of that classification as set forth in 780 CMR 120.H.

SIGN STRUCTURE. Any structure which supports or is capable of supporting a sign as defined in 780 CMR. A sign structure is permitted to be a single pole and is not required to be an integral part of the building.

WALL SIGN. Any sign attached to or erected against the wall of a building or structure, with the exposed face of the sign in a plane parallel to the plane of said wall.

780 CMR 120.H103 LOCATION

120.H103.1 Location Restrictions. Signs shall not be erected, constructed or maintained so as to obstruct any fire escape or any window or door or opening used as a means of egress or so as to prevent free passage from one part of a roof to any other part thereof. A sign shall not be attached in any form, shape or manner to a fire escape, nor be placed in such manner as to interfere with any opening required for ventilation.

A sign shall not be located in violation of local zoning requirements.

780 CMR 120.H104 IDENTIFICATION

120.H104.1 Identification. Every outdoor advertising display sign hereafter erected, constructed or maintained, for which a permit is required shall be plainly marked with the name of the person, firm or corporation erecting and maintaining such sign and shall have affixed on the front thereof the permit number issued for said sign or other method of identification approved by the building official.

780 CMR 120.H105 DESIGN AND CONSTRUCTION

120.H105.1 General Requirements. Signs shall be designed and constructed to comply with the provisions of 780 CMR for use of materials, loads and stresses.

120.H105.2 Permits, Drawings and Specifications. Where a permit is required, as provided in 780 CMR 1.00, construction documents shall be required. These documents shall show the dimensions, material and required details of construction, including loads, stresses and anchors.

120.H105.3 Wind Load. Signs shall be designed and constructed to withstand wind pressure as provided for in 780 CMR 16.00.

120.H105.4 Seismic Load. Signs designed to withstand wind pressures shall be considered capable of withstanding earthquake loads, except as provided for in 780 CMR 16.00.

120.H105.5 Working Stresses. In outdoor advertising display signs, the allowable working stresses shall conform to the requirements of 780 CMR 16.00. The working stresses of wire rope and its fastenings shall not exceed 25% of the ultimate strength of the rope or fasteners.

Exceptions:

1. The allowable working stresses for steel and wood shall be in accordance with the provisions of 780 CMR 22.00 and 23.00.
2. The working strength of chains, cables, guys or steel rods shall not exceed one-fifth of the ultimate strength of such chains, cables, guys or steel.

120.H105.6 Attachment. Signs attached to masonry, concrete or steel shall be safely and securely fastened by means of metal anchors, bolts or approved expansion screws of sufficient size and anchorage to safely support the loads applied.

780 CMR 120.H106 ELECTRICAL

120.H106.1 **Illumination**. A sign shall not be illuminated by other than electrical means, and electrical devices and wiring shall be installed in accordance with the requirements of 527 CMR 12.00: ***Massachusetts Electrical Code***.

120.H106.1.1 Internally Illuminated Signs. Except as provided for in 780 CMR 402.14 and 2611, where internally illuminated signs have sign facings of wood or approved plastic, the area of such facing section shall not be more than 120 square feet (11.16 m^2) and the wiring for electric lighting shall be entirely enclosed in the sign cabinet with a clearance of not less than two inches (51 mm) from the facing material. The dimensional limitation of 120 square feet (11.16 m^2) shall not apply to sign facing sections made from flame- resistant-coated fabric (ordinarily known as "flexible sign face plastic") that weighs less than 20 ounces per square yard (678 g/m^2) and which, when tested in accordance with NFPA 701, meets the requirements of both the small-scale test and the large-scale test, or which, when tested in accordance with an approved test method, exhibits an average burn time for ten specimens of two seconds or less and a burning extent of 15 centimeters or less.

120.H106.2 **Electrical Service**. Signs that require electrical service shall comply with 527 CMR 12.00: ***Massachusetts Electrical Code***.

780 CMR 120.H107 COMBUSTIBLE MATERIALS

120.H107.1 Use of Combustibles. Wood, approved plastic or plastic veneer panels as provided for in 780 CMR 26.00, or other materials of combustible characteristics similar to wood, used for moldings, cappings, nailing blocks, letters and latticing, shall comply with 780 CMR 120.H109.1, and shall not be used for other ornamental features of signs, unless approved.

120.H107.1.1 Plastic Materials. Notwithstanding any other provisions of 780 CMR plastic materials which burn at a rate no faster than 2.5 inches per minute (64 mm/s) when tested in accordance with ASTM D 635 shall be deemed approved plastics and can be used as the display surface material and for the letters, decorations and facings on ***outdoor*** signs and outdoor display structures.

Note: For signs, other than those identified in 780 CMR 120.H101.2 and that are used indoors, plastic sign materials shall conform to the applicable requirements set forth in 780 CMR 26.00.

120.H107.1.2 Electric Sign Faces. Individual plastic facings of electric signs shall not exceed 200 square feet (18.6 m^2) in area.

120.H107.1.3 Area Limitation. If the area of a display surface exceeds 200 square feet (18.6 m^2), the area occupied or covered by approved plastics shall be limited to 200 square feet (18.6 m^2) plus 50% of the difference between 200 square feet (18.6 m^2) and the area of display surface. The area of plastic on a display surface shall not in any case exceed 1,100 square feet (102 m^2).

120.H107.1.4 Plastic Appurtenances. Letters and decorations mounted on an approved plastic facing or display surface can be made of approved plastics.

780 CMR 120.H108 ANIMATED DEVICES

120.H108.1 Fail-safe Device. Signs that contain moving sections or ornaments shall have fail-safe provisions to prevent the section or ornament from releasing and falling or shifting its center of gravity more than 15 inches (381 mm). The fail-safe device

shall be in addition to the mechanism and the mechanism's housing which operate the movable section or ornament. The fail-safe device shall be capable of supporting the full dead weight of the section or ornament when the moving mechanism releases.

780 CMR 120.H109 GROUND SIGNS

120.H109.1 Height Restrictions. The structural frame of ground signs shall not be erected of combustible materials to a height of more than 35 feet (10668 mm) above the ground. Ground signs constructed entirely of noncombustible material shall not be erected to a height of greater than 100 feet (30 480 mm) above the ground. Greater heights are permitted where approved and located so as not to create a hazard or danger to the public.

120.H109.2 Required Clearance. The bottom coping of every ground sign shall be not less than three feet (914 mm) above the ground or street level, which space can be filled with platform decorative trim or light wooden construction.

120.H109.3 Wood Anchors and Supports. Where wood anchors or supports are embedded in the soil, the wood shall be pressure treated with an approved preservative.

780 CMR 120.H110 ROOF SIGNS

120.H110.1 General. Roof signs shall be constructed entirely of metal or other approved noncombustible material except as provided for in 780 CMR 120.H106.1.1 and 120.H107.1. Provisions shall be made for electric grounding of metallic parts. Where combustible materials are permitted in letters or other ornamental features, wiring and tubing shall be kept free and insulated there from. Roof signs shall be so constructed as to leave a clear space of not less than six feet (1829 mm) between the roof level and the lowest part of the sign and shall have at least five feet (1524 mm) clearance between the vertical supports thereof. No portion of any roof sign structure shall project beyond an exterior wall.

Exception: Signs on flat roofs with every part of the roof accessible.

120.H110.2 Bearing Plates. The bearing plates of roof signs shall distribute the load directly to or upon masonry walls, steel roof girders, columns or beams. The building shall be designed to avoid overstress of these members.

120.H110.3 Height of Solid Signs. A roof sign having a solid surface shall not exceed, at any point, a height of 24 feet (7315 mm) measured from the roof surface.

120.H110.4 Height of Open Signs. Open roof signs in which the uniform open area is not less than 40% of total gross area shall not exceed a height of 75 feet (22 860 mm) on buildings of Type 1 or Type 2 construction. On buildings of other construction types, the height shall not exceed 40 feet (12 192 mm). Such signs shall be thoroughly secured to the building upon which they are installed, erected or constructed by iron, metal anchors, bolts, supports, chains, stranded cables, steel rods or braces and they shall be maintained in good condition.

120.H110.5 Height of Closed Signs. A closed roof sign shall not be erected to a height greater than 50 feet (15 240 mm) above the roof of buildings of Type 1 or Type 2 construction, nor more than 35 feet (10 668 mm) above the roof of buildings of Type 3, 4 or 5 construction.

780 CMR 120.H111 WALL SIGNS

120.H111.1 Materials. Wall signs which have an area exceeding 40 square feet (3.72 m^2) shall be constructed of metal or other approved noncombustible material, except for nailing rails and as provided for in 780 CMR H106.1.1 and H107.1.

120.H111.2 Exterior Wall Mounting Details. Wall signs attached to exterior walls of solid masonry, concrete or stone shall be safely and securely attached by means of metal anchors, bolts or expansion screws of not less than ⅜ inch (9.5 mm) diameter and shall be embedded at least five inches (127 mm). Wood blocks shall not be used for anchorage, except in the case of wall signs attached to buildings with walls of wood. A wall sign shall not be supported by anchorages secured to an unbraced parapet wall.

120.H111.3 Extension. Wall signs shall not extend above the top of the wall, nor beyond the ends of the wall to which the signs are attached unless such signs conform to the requirements for roof signs, projecting signs or ground signs.

780 CMR 120.H112 PROJECTING SIGNS

120.H112.1 General. Projecting signs shall be constructed entirely of metal or other noncombustible material and securely attached to a building or structure by metal supports such as bolts, anchors, supports, chains, guys or steel rods. Staples or nails shall not be used to secure any projecting sign to any building or structure. The dead load of projecting signs not parallel to the building or structure and the load due to wind pressure shall be supported with chains, guys or steel rods having net cross-sectional dimension of not less than ⅜ inch (9.5 mm) diameter. Such supports shall be erected or maintained at an angle of at least 45% (0.78 rad) with the horizontal to resist the dead load and at angle of 45% (0.78 rad) or more with the face of the sign to resist the specified wind pressure. If such projecting sign exceeds 30 square feet (2.8 m^2) in one facial area, there shall be provided at least two such supports on each side not more than eight feet (2438 mm) apart to resist the wind pressure.

120.H112.2 Attachment of Supports. Supports shall be secured to a bolt or expansion screw that will develop the strength of the supporting chains, guys or steel rods, with a minimum ⅝-inch (15.9 mm) bolt or lag screw, by an expansion shield. Turn buckles shall be placed in chains, guys or steel rods supporting projecting signs.

120.H112.3 Wall Mounting Details. Chains, cables, guys or steel rods used to support the live or dead load of projecting signs are permitted to be fastened to solid masonry walls with expansion bolts or by machine screws in iron supports, but such supports shall not be attached to an unbraced parapet wall. Where the supports must be fastened to walls made of wood, the supporting anchor bolts must go through the wall and be plated or fastened on the inside in a secure manner.

120.H112.4 Height Limitation. A projecting sign shall not be erected on the wall of any building so as to project above the roof or cornice wall or above the roof level where there is no cornice wall; except that a sign erected at a right angle to the building, the horizontal width of which sign is perpendicular to such a wall and does not exceed 18 inches (457 mm), is permitted to be erected to a height not exceeding two feet (610 mm) above the roof or cornice wall or above the roof level where there is no cornice wall. A sign attached to a corner of a building and parallel to the vertical line of such corner shall be deemed to be erected at a right angle to the building wall.

120.H112.5 Additional Loads. Projecting sign structures which will be used to support an individual on a ladder or other servicing device, whether or not specifically designed for the servicing device, shall be capable of supporting the anticipated additional load, but not less than a 100-pound (445 N) concentrated horizontal load and a 300-pound (1334 N) concentrated vertical load applied at the point of assumed or most eccentric loading. The building component to which the projecting sign is attached shall also be designed to support the additional loads.

780 CMR 120.H113 MARQUEE SIGNS

120.H113.1 Materials. Marquee signs shall be constructed entirely of metal or other approved noncombustible material except as provided for in 780 CMR 120.H106.1.1 and 120.H107.1.

120.H113.2 Attachment. Marquee signs shall be attached to approved marquees that are constructed in accordance with 780 CMR 3106.

120.H113.3 Dimensions. Marquee signs, whether on the front or side, shall not project beyond the perimeter of the marquee.

120.H113.4 Height Limitation. Marquee signs shall not extend more than six feet (1829 mm) above, nor one foot (305 mm) below such marquee, but under no circumstances shall the sign or signs have a vertical dimension greater than eight feet (2438 mm).

782 CMR 120.H114 PORTABLE SIGNS

120.H114.1 General. Portable signs shall conform to requirements for ground, roof, projecting, flat and temporary signs where such signs are used in a similar capacity. The requirements of this section shall not be construed to require portable signs to have connections to surfaces, tie-downs or foundations where provisions are made by temporary means or configuration of the structure to provide stability for the expected duration of the installation.

Table 120.H 4-A
SIZE, THICKNESS AND TYPES OF GLASS PANELS IN SIGNS

MAXIMUM SIZE OF EXPOSED PANEL		MINIMUM THICKNESS OF GLASS (inches)	TYPE OF GLASS
Any dimension (inches)	Area (square inches)		
30	500	⅛	Plain, plate or wired
45	700	3/16	Plain, plate or wired
144	3,600	¼	Plain, plate or wired
>144	>3,600	¼	Wired glass

For SI: 1 inch = 25.4 mm 1 square inch = 645mm^2

TABLE 120.H 4-B
THICKNESS OF PROJECTION SIGN

PROJECTION (feet)	MAXIMUM THICKNESS (feet)
5	2
4	2.5
3	3
2	3.5
1	4

For SI: 1 foot = 304.8 mm

780 CMR 120.H115 REFERENCED STANDARDS

ASTM D 635-98	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position	120.H107.1.1
527 CMR 12.00	Massachusetts Electrical Code	120.H106.1, 120.H106.2
NFPA 701-99	Methods of Fire Test for Flame Propagation of Textiles and Films	120.H106.1.1

NON-TEXT PAGE

780 CMR 120.I

PATIO COVERS

(Note: *780 CMR 120.I is unique to Massachusetts*)

780 CMR 120.I101 GENERAL

120.I101.1 Scope. Patio covers shall conform to the requirements of 780 CMR 120.I. Patio covers shall be permitted to be detached from or attached to dwelling units and other Use Group structures. Patio covers shall be used only for recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms. Openings shall be permitted to be enclosed with insect screening, approved translucent or transparent plastic not more that 0.125 inch (3.2 mm) in thickness, glass conforming to the provisions of 780 CMR 53.00 for one- and two-family dwellings or 780 CMR 24.00 for all other USE Groups or any combination of the foregoing

780 CMR 120.I102 DEFINITION

120.I102.1 General. The following term shall, for the purposes of 780 CMR 120.I have the meaning shown in 780CMR 120.I102.

PATIO COVERS. One-story structures not exceeding 12 feet (3657 mm) in height. Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65% of the area below a minimum of six feet eight inches (2032 mm) of each wall, measured from the floor. Openings shall be permitted to be enclosed with:

1. ***insect screening,***
2. ***approved translucent or transparent plastic not more than 0.125 inch (3.2 mm) in thickness,***
3. ***glass conforming to the provisions of 780 CMR 5308.0, or 780 CMR 24.00 as applicable or***
4. ***any combination of the foregoing.***

780 CMR 120.I103 STRUCTURAL PROVISIONS

120.I103.1 General. Patio covers shall be designed and constructed to sustain, within the stress limits of 780 CMR, all dead loads plus a minimum vertical live load of ten pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such patio covers shall be designed to resist the minimum wind and seismic loads set forth in 780 CMR, as applicable.

120.I103.2 Footings. Patio covers shall be erected on permanent supports extending a minimum of four feet (1.2m) below finished grade except when such supports are placed on solid rock or otherwise protected from frost. All patio cover supports shall be designed for the loads required carried

780 CMR 120.I104 LIGHT AND VENTILATION/EMERGENCY EGRESS

120.I104.1 General. Exterior openings required for light and ventilation shall be permitted to open into a patio structure conforming to 780 CMR 120.I, provided that the patio structure shall be unenclosed if such openings are serving as emergency egress or rescue openings from sleeping rooms. Where such exterior openings serve as an exit from the dwelling unit, the patio structure, unless unenclosed, shall be provided with exits conforming to the provisions of 780 CMR 10.00 or 780 CMR 53.00, as applicable.

780 CMR 120.I105 SPECIAL PROVISIONS FOR ALUMINUM SCREEN ENCLOSURES IN HURRICANE-PRONE REGIONS

120.I105.1 General. Screen enclosures in hurricane-prone regions shall be in accordance with the provisions of 780 CMR 120.I105

120.1105.1.1 Habitable Spaces. Screen enclosures shall not be considered habitable spaces.

120.1105.1.2 Minimum Ceiling Height. Screen enclosures shall have a ceiling height of not less than seven feet (2134 mm) for one- and two-family detached dwellings and seven feet six inches (2286 mm) for all other applications.

120.I105.2 Definitions.

20.I105.1 The following term shall, for the purposes of 780 CMR 120.I, have the meaning shown in 780 CMR 120.I105.2

SCREEN ENCLOSURE. A building or part thereof, in whole or in part self-supporting, and having walls of insect screening and a roof of insect screening, plastic, aluminum, or similar lightweight material.

120.I105.3 Screen Enclosures Minimum Specifications.

120.I105.3.1 Thickness. Actual wall thickness of extruded aluminum members shall be not less than 0.040 inches (1.02 mm).

120.I105.3.2 Density. Screen density shall be a maximum of 20 threads per inch by 20 threads per inch mesh.

120.I105.4 Design.

120.I105.4.1 Wind Load. Structural members supporting screen enclosures shall be designed to support minimum wind loads given in 780 CMR Table 120.I105.4(1) and 120.I105.4(2). Where any value is less than ten psf (0.479 kN/m^2) use ten psf (0.479 kN/m^2).

120.I105.4.2 Deflection Limit. For members supporting screen surfaces only, the total load deflection shall not exceed 1/60. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

120.I105.4.3 Importance Factor. Utilizing ASCE-7, as referenced in 780 CMR 1604.5, the wind factor for screen enclosures shall be 0.77.

120.I105.4.4 Roof Live Load. The minimum roof live load shall be ten psf (0.479 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum.

780 CMR TABLE 120.I105.4(1)
DESIGN WIND PRESSURES FOR ALUMINUM SCREEN ENCLOSURE FRAMING WITH AN IMPORTANCE FACTOR OF 0.77[a, b, c]

LOAD CASE	WALL	Basic Wind Speed (mph)											
		100		110		120		130		140		150	
		Exposure Category Design Pressure (psf)											
		C	B	C	B	C	B	C	B	C	B	C	B
A[d]	Windward and leeward walls (flow through) and windward wall (non-flow through) L/W = 0-1	12	8	14	10	17	12	19	14	23	16	26	18
A[d]	Windward and leeward walls (flow through) and windward wall (non-flow through) L/W = 2	13	9	16	11	19	14	22	16	26	18	30	21
B[e]	Windward: Non-gable roof	16	12	20	14	24	17	28	20	32	23	37	26
B[e]	Windward: Gable roof	22	16	27	19	32	23	38	27	44	31	50	36
	ROOF												
All[f]	Roof-screen	4	3	5	4	6	4	7	5	8	6	9	7
All[f]	Roof-solid	12	9	15	11	18	13	21	15	24	17	28	20

For SI: One mile per hour = 0.44 m/s, one pound per square foot = 0.0479kPa, one foot = 304.8 mm.

a. Values have been reduced for 0.77 Importance Factor in accordance with 780 CMR 1604.5 and ASCE-7.
b. Minimum design pressure shall be ten psf in accordance with 780 CMR 1609. If a higher design pressure is determined, then that higher design pressure shall be utilized.
c. Loads are applicable to screen enclosures with a mean roof height of 30 feet or less. For screen enclosures of different heights the pressures given shall be adjusted by multiplying the applicable pressure from 780 CMR Table 120.I105.4(1) by the adjustment factor given in 780 CMR Table 120.I105.4(2).
d. For Load Case A flow-through condition, the pressure given shall be applied simultaneously to both the upwind and downwind screen walls acting in the same direction as the wind. The structure shall also be analyzed for wind coming from the opposite direction. For the non-flow through condition, the screen enclosure wall shall be analyzed for the load applied acting toward the interior of the enclosure.
e. For Load Case B, the appropriate Table 120.I105.4(1) pressure multiplied by the projected frontal area of the screen enclosure is the total drag force, including drag on screen surfaces parallel to the wind, which must be transmitted to the ground. Use Load Case A for members directly supporting the screen surfaces perpendicular to the wind. Load Case B loads shall be applied only to structural members which carry wind loads from more than one surface
f. The roof structure shall be analyzed for the pressure given occurring both upward and downward.

780 CMR TABLE 120.I105.4(2)
HEIGHT ADJUSTMENT FACTORS

Mean Roof Height (ft)	EXPOSURE	
	B	C
15	1	0.86
20	1	0.92
25	1	0.96
30	1	1.00
35	1.05	1.03
40	1.09	1.06
45	1.12	1.09
50	1.16	1.11
55	1.19	1.14
60	1.22	1.16

For SI: One foot = 304.8 mm.

780 CMR 120.J

GRADING

780 CMR 120.J101 GENERAL

120.*J101.1 Scope. The provisions of 780 CMR 120.J apply to grading, excavation and earthwork construction, including fills and embankments only when directly associated with the construction, reconstruction, alteration, repair and/or demolition of buildings and structures (see M.G.L. c.143, §§ 93 through 100)*. Where conflicts occur between the technical requirements of 780 CMR 120.J and the soils report, the soils report shall govern.

120.J101.1.1 Appendix Limits Further Delineated. 780 CMR 120.J, contains grading provisions that address soil-related hazards such as slope failure, landslides and erosion that can be encountered in large commercial building developments or in large residential subdivisions where grading problems may arise and that are otherwise not addressed by 780 CMR.

120.J101.2 Flood Hazard Areas. The provisions of 780 CMR 120.J shall not apply to grading, excavation and earthwork construction, including fills and embankments, in floodways within flood hazard areas established in 780 CMR 1612 and 780 CMR 120.G unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed work will not result in any increase in the level of the base flood.

Note 1: Before commencing digging, Massachusetts state law requires advance notice of at least 72 hours in Massachusetts (excluding weekends and holidays) before you get ready to begin your outdoor project. One call to Dig Safe is all it takes to notify all member utility companies of your excavation project. In turn, these utilities respond to the work area and mark the location of their underground facilities. Callers are given a permit number as confirmation. Before digging, first call "Dig Safe" (1-888-DIG-SAFE).

Note 2: Proposed grading activity in and around wetlands and other areas subject either to the requirements of M.G.L. c. 131, § 40 or certain Department of Environmental Protection regulations must also conform to such other requirements.

780 CMR 120.J102 DEFINITIONS

120.J102.1 Definitions. For the purposes of 780 CMR 120.J, the terms, phrases and words listed in 780 CMR 120.J102 and their derivatives shall have the indicated meanings.

BENCH. A relatively level step excavated into earth material on which fill is to be placed.

COMPACTION. The densification of a fill by mechanical means.

CUT. See Excavation.

DOWN DRAIN. A device for collecting water from a swale or ditch located on or above a slope, and safely delivering it to an approved drainage facility

EROSION. The wearing away of the ground surface as a result of the movement of wind, water or ice.

EXCAVATION. The removal of earth material by artificial means, also referred to as a cut.

FILL. Deposition of earth materials by artificial means.

GRADE. The vertical location of the ground surface.

GRADE, EXISTING. The grade prior to grading.

GRADE, FINISHED. The grade of the site at the conclusion of all grading efforts.

GRADING. An excavation or fill or combination thereof.

KEY. A compacted fill placed in a trench excavated in earth material beneath the toe of a slope.

All slope references in the chapter have been modified to show the horizontal:vertical relationship.

SLOPE. An inclined surface, the inclination of which is expressed as a ratio of horizontal distance to vertical distance.

TERRACE. A relatively level step constructed in the face of a graded slope for drainage and maintenance purposes.

780 CMR 120.J103 PERMITS REQUIRED

120.J103.1 Permits Required. Except as exempted in 780 CMR 120.J103.2, no grading directly associated with building/structure construction/reconstruction/repair/demolition shall be performed without first having obtained a permit therefor from the building official. ***A grading permit does not include the construction of retaining walls or other structures – a separate permit for retaining wall systems is required where retaining walls are large enough to require a building permit (see 780 CMR 110)***.

120.J103.2 Exemptions. A grading permit shall not be required for the following:

1. Grading in an isolated, self-contained area, provided there is no danger to the public, and that such grading will not adversely affect adjoining properties.
2. Excavation for construction of a structure

permitted under 780 CMR.

3. Cemetery graves.

4. Refuse disposal sites controlled by other regulations.

5. Excavations for wells, or trenches for utilities.

6. Mining, quarrying, excavating, processing or stockpiling rock, sand, gravel, aggregate or clay controlled by other regulations, provided such operations do not affect the lateral support of, or significantly increase stresses in, soil on adjoining properties.

7. Exploratory excavations performed under the direction of a registered design professional "Exploratory excavation" is not to be construed as allowing construction of a building to begin prior to receiving a permit for the sole purpose of preparing a soils report.1

8. Grading not directly associated with building or structure construction / reconstruction / repair / demolition regulated by 780 CMR.

Exemption from the permit requirements of 780 CMR 120.J shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of 780 CMR or any other laws or ordinances of this jurisdiction.

780 CMR 120.J104 PERMIT APPLICATION AND SUBMITTALS

120.J104.1 Submittal Requirements. In addition to the provisions of 780 CMR 105.3, the applicant shall state the estimated quantities of excavation and fill.

120.J104.2 Site Plan Requirements. In addition to the provisions of 780 CMR 106, a grading plan shall show the existing grade and finished grade in contour intervals of sufficient clarity to indicate the nature and extent of the work and show in detail that it complies with the requirements of 780 CMR. Drafting requirements were deleted here. The plans shall show the existing grade on adjoining properties in sufficient detail to identify how grade changes will conform to the requirements of 780 CMR.

120.J104.3 Soils Report. A soils report prepared by registered design professionals shall be provided which shall identify the nature and distribution of existing soils; conclusions and recommendations for grading procedures; soil design criteria for any structures or embankments required to accomplish the proposed grading; and, where necessary, slope stability studies, and recommendations and conclusions regarding site geology.

Exception: A soils report is not required where the building official determines that the nature of the work applied for is such that a report is not necessary.

120.J104.4 Liquefaction Study. For sites with mapped maximum considered earthquake spectral response accelerations at short periods (S_s) greater than 0.5g as determined by 780 CMR 1615, a study of the liquefaction potential of the site shall be provided, and the recommendations incorporated in the plans – ***note that seismic evaluation is not required for one- and two-family detached dwellings.***

Exception: A liquefaction study is not required where the building official is provided with acceptable technical evidence, determined by a design professional (Massachusetts registered architect or engineer) that determines from established local data that the liquefaction potential is low.

780 CMR 120.J105 INSPECTIONS

120.J105.1 General. Inspections shall be governed by 780 CMR 109.

120.J105.2 Special Inspections. The special inspection requirements of 780 CMR 1704.7 shall apply to work performed under a grading permit where required by the building official.

780 CMR 120.J106 EXCAVATIONS

120.J106.1 Maximum Slope. The slope of cut surfaces shall be no steeper than is safe for the intended use, and shall be no steeper than two horizontal to one vertical (50%) unless the applicant furnishes a soils report justifying a steeper slope.

Exceptions:

1. A cut surface may be at a slope of 1.5 horizontal to one vertical (67%) provided that all the following are met:
   1.1. It is not intended to support structures or surcharges.
   1.2. It is adequately protected against erosion.
   1.3. It is no more than eight feet (2438 mm) in height.
   1.4. It is approved by the building official.
2. A cut surface in bedrock shall be permitted to be at a slope of one horizontal to one vertical (100%).

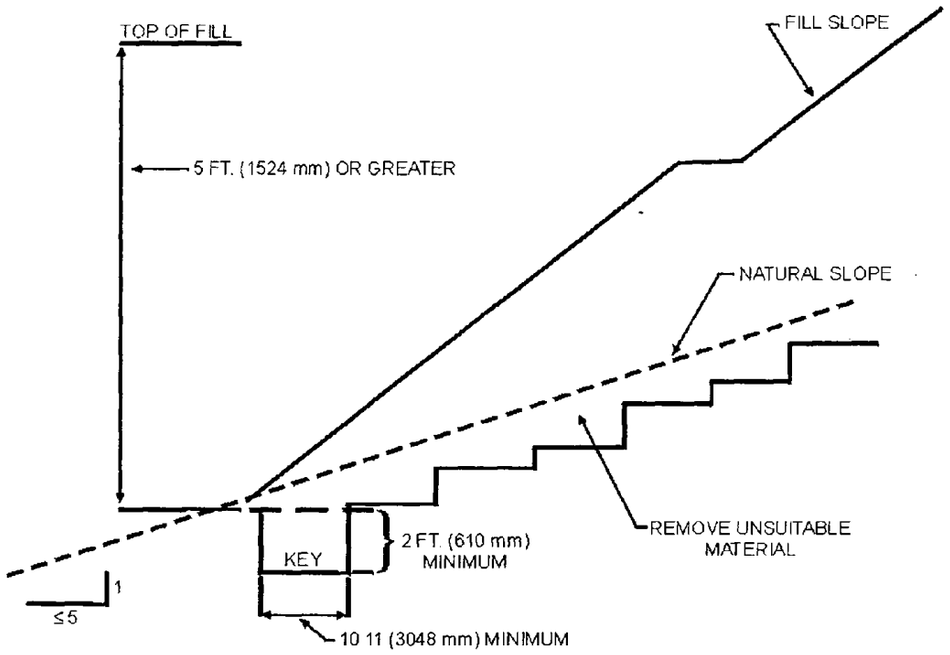
780 CMR 120.J107 FILLS

120.J107.1 General. Unless otherwise recommended in the soils report, fills shall conform to provisions of 780 CMR 120.J107.

120.J107.2 Surface Preparation. The ground surface shall be prepared to receive fill by removing vegetation, topsoil and other unsuitable materials, and scarifying the ground to provide a bond with the fill material.

120.J107.3 Benching. Where existing grade is at a slope steeper than five horizontal to one vertical (20 percent) and the depth of the fill exceeds five feet (1524 mm) benching shall be provided in accordance with Figure 780 CMR 120.J107.3. A key shall be provided which is at least ten feet (3048 mm) in width and two feet (610 mm) in depth.

Figure 780 CMR 120.J107.3
BENCHING DETAILS



For SI: one foot = 304.8 mm

120.J107.4 Fill Material. Fill material shall not include organic, frozen or other deleterious materials. No rock or similar irreducible material greater than 12 inches (305 mm) in any dimension shall be included in fills.

120.J107.5 Compaction. All fill material shall be compacted to 90% of maximum density as determined by ASTM D1557, Modified Proctor, in lifts not exceeding 12 inches (305 mm) in depth.

120.J107.6 Maximum Slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes steeper than two horizontal to one vertical (50%) shall be justified by soils reports or engineering data.

780 CMR 120.J108 SETBACKS

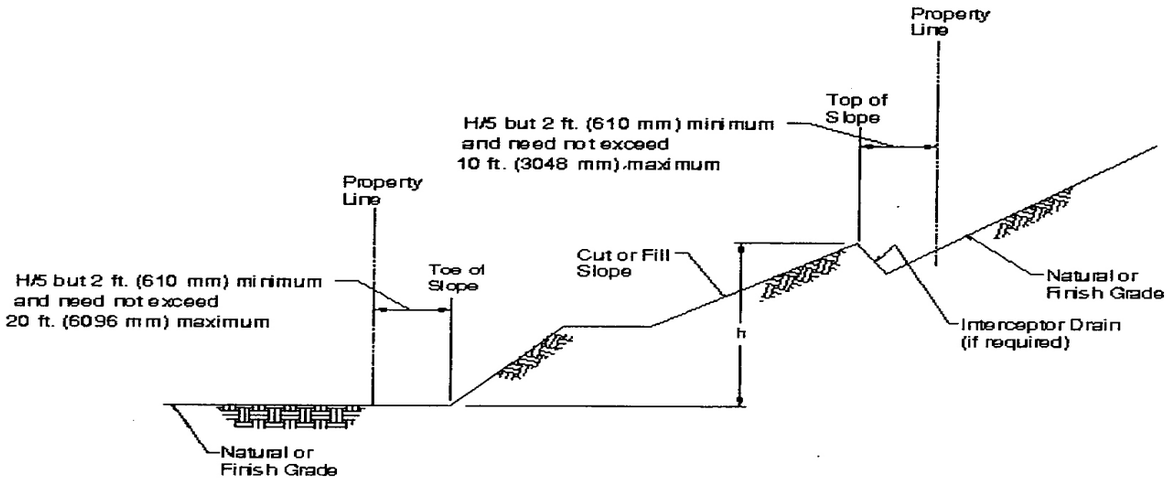
120.J108.1 General. Cut and fill slopes shall be set back from the property lines in accordance with 780 CMR 120.J108. Setback dimensions shall be measured perpendicular to the property line and shall be as shown in Figure 780 CMR J108.1, unless substantiating data is submitted justifying reduced setbacks.

120.J108.2 Top of Slope. The setback at the top of a cut slope shall not be less than that shown in Figure 780 CMR 120.J108.1, or than is required to accommodate any required interceptor drains, whichever is greater.

120.J108.3 Slope Protection. Where required to protect adjacent properties at the toe of a slope from adverse effects of the grading, additional protection, approved by the building official, shall be included. Such protection may include but shall not be limited to:

1. Setbacks greater than those required by Figure 780 CMR 120.J108.1.
2. Provisions for retaining walls or similar construction.
3. Erosion protection of the fill slopes.
4. Provision for the control of surface waters.

Figure 780 CMR 120.J108.1
DRAINAGE DIMENSIONS



For SI: One foot - 304.8 mm

780 CMR 120.J109 DRAINAGE AND TERRACING

120.J109.1 General. Unless otherwise recommended by a registered design professional, drainage facilities and terracing shall be provided in accordance with the requirements of 780 CMR 120.J109.

Exception: Drainage facilities and terracing need not be provided where the ground slope is not steeper than three horizontal to one vertical (33%).

120.J109.2 Terraces. Terraces at least six feet (1829 mm) in width shall be established at not more than 30-foot (9144 mm) vertical intervals on all cut or fill slopes to control surface drainage and debris. Suitable access shall be provided to allow for cleaning and maintenance.

Where more than two terraces are required, one terrace, located at approximately mid-height, shall be at least 12 feet (3658 mm) in width.

Swales or ditches shall be provided on terraces. They shall have a minimum gradient of 20 horizontal to one vertical (5%) and shall be paved with concrete not less than three inches (76 mm) in thickness, or with other materials suitable to the application. They shall have a minimum depth of 12 inches (305 mm) and a minimum width of five feet (1524 mm).

A single run of swale or ditch shall not collect runoff from a tributary area exceeding 13,500 square feet (1256 m^2) (projected) without discharging into a down drain.

120.J109.3 Interceptor Drains. Interceptor drains shall be installed along the top of cut slopes receiving drainage from a tributary width greater than 40 feet, measured horizontally. They shall have a minimum depth of one foot (305 mm) and a minimum width of three feet (915 mm). The slope shall be approved by the building official, but shall not be less than 50 horizontal to one vertical (2%). The drain shall be paved with concrete not less than three inches (76 mm) in thickness, or by other materials suitable to the application. Discharge from the drain shall be accomplished in a manner to prevent erosion and shall be approved by the building official.

120.J109.4 Drainage Across Property Lines. Drainage across property lines shall not exceed that which existed prior to grading. Excess or concentrated drainage shall be contained on site or directed to an approved drainage facility. Erosion of the ground in the area of discharge shall be prevented by installation of nonerosive down drains or other devices.

780 CMR 120.J110 EROSION CONTROL

120.J110.1 General. The faces of cut and fill slopes shall be prepared and maintained to control erosion. This control shall be permitted to consist of effective planting.

Exception: Erosion control measures need not be provided on cut slopes not subject to erosion due to the erosion-resistant character of the materials.

Erosion control for the slopes shall be installed as soon as practicable and prior to calling for final inspection.

120.J110.2 Other Devices. Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety.

780 CMR 120.J111 REFERENCED STANDARDS

ASTM D 1557-00	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort [56,000 ft-lbs/ft^3 (2,700kN-m/m^3)]	120.J107.5