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Chapter 202

Subdivision of Land

Article III

Design Standards and Improvements

§ 202-12 **General requirements.**

- A. Design guides. All subdivisions shall be designed and improvements made by the developer consistent with the requirements of this article. Design and construction shall:
- (1) Reduce, to the extent reasonably possible, the following:
 - (a) Volume of cut and fill.
 - (b) Area over which existing vegetation will be disturbed, especially if within 200 feet of a river, pond or stream or having a slope of more than 15%.
 - (c) Number of mature trees removed.
 - (d) Extent of waterways altered or relocated.
 - (e) Visual prominence of man-made elements not necessary for safety or orientation.
 - (f) **Volume and contamination of runoff.**
 - (2) Increase, to the extent reasonably possible, the following:
 - (a) Use of collector streets to avoid traffic on streets providing house frontages.
 - (b) Visual prominence of natural features of the landscape.
 - (c) Vistas from public ways.
- B. Required cross section. Street construction shall conform to the required street cross section included as Exhibit A with these rules and regulations. Grass strips and driveway entrances shall be so graded as to prevent surface water on the street from running onto private land.
- C. Extension. Reasonable provisions shall be made for extension of pavements and utilities to adjoining properties, including installation of water gates and manholes, if necessary. The developer shall not deny others connection to the water system, drainage or cable utilities, provided that they pay all costs of such connection and comply with all applicable requirements of the Town of Chelmsford or any

relevant water districts.

- D. Construction standards. In the event of any question as to construction details, specifications for the composition of material, workmanship and the method of applying materials or in the absence of established town standards, or if town standards are less demanding, standards of the Massachusetts Department of Public Works shall apply in each instance.
- E. Compliance with Zoning Bylaw. The location of buildings and other structures on land involved in subdivision or other plans submitted to the Board and the division of such land into lots shall comply with the Town Zoning Bylaw then in effect or with a variance granted by the Town Board of Appeals.
- F. No expense to town. All streets, footpaths, water mains and pipes, hydrants, fire alarm systems, drains, catch basins, culverts and other related facilities and municipal services shall be installed in subdivisions and completed in accordance with these rules and regulations and without expense to the town. Water mains and pipes (other than service pipes), hydrants and fire alarm systems will be installed by the appropriate water district or the town at the expense of the subdivider or will be installed by the developer and/or subdivider at his or her expense in accordance with specifications established by the water district and subject to its inspection, as directed by the Planning Board. In installing the fire alarm system within a subdivision, the developer shall connect the same to the town's existing fire alarm system at a location designated by the Fire Chief.

§ 202-13 **Streets.**

A. Horizontal design.

- (1) Width of streets. All streets shall be designed so as to provide safe travel for vehicles and pedestrians. Streets shown on subdivision plans shall be classified as business streets, collector streets, minor streets or lanes, and minimum widths shall be the following:

	Right-of-Way	Pavement
Type of Street	(feet)	(feet)
Business street	60	34
Collector street	60	30
Minor street	50	26
Lane	40	22
Off-street path	8	Varies

- (2) Planned projections of streets into adjoining property. Streets within the subdivision shall be projected to connect with existing or proposed streets on adjoining property which come up to the boundary line.
 - (a) If adjoining property is not subdivided but is, in the opinion of the Board, suitable for eventual development, provision shall be made for proper projection of streets into such property by continuing appropriate streets within the subdivision to the exterior boundary thereof.
 - (b) Streets with temporary dead ends, laid out to permit future projection, shall conform to the provisions of

alignment, width and grade that would be applicable to such streets if extended.

- (3) Curvilinearity. Curvilinear street systems shall be used wherever feasible.
- (4) Radii. The minimum center-line radii shall be 300 feet for business or collector streets, 150 feet for minor streets and 100 feet for lanes.
- (5) Intersections. Street lines shall be laid out so as to intersect as nearly as possible at right angles. No street shall intersect any other street at less than 60°. Wherever possible, street intersections shall be at least 150 feet apart. Intersections involving collector streets shall be spaced at least 400 feet apart. Curblines at intersections shall be cut back so as to provide for corner radii of not less than 30 feet at any intersection with a business or collector street and of not less than 20 feet at any other intersection. Intersections shall be located in locations that provide safe corner sight distances. Wherever possible, the sight distance shall conform to the following: **[Amended 9-28-1994]**

Sight Distance

Proposed Street	Intersecting Street	(feet)
Lane	Lane	200
Any street	Minor, collector or business	300

- (6) Dead ends. Permanent dead-end streets (a street, extension of a street or system of streets connected to other streets only at a single point) shall not serve more than 10 lots unless, in the opinion of the Board, they are necessitated by topography or other local conditions. If dead-end streets are approved, a turnaround with a radius of at least 62.5 feet to the outside of the layout will be required. Temporary dead-ends shall similarly provide for a turnaround, which may be located in part on easements over lots so long as contractual assurance is provided that upon extension of the street the terminated turnaround will be removed and replaced with loam and planting.
- (7) Reserve strips. Reserve strips or barriers prohibiting access to streets or adjoining property will not be permitted.

B. Vertical alignment.

- (1) Grades of streets. Grades of streets along the gutter line shall be not less than 1%. Vertical curves are required wherever the algebraic difference in grade between center-line tangents exceeds 1%. Maximum street grade and vertical curve length shall conform to the following: **[Amended 9-28-1994]**

Forward Sight Distance

Type of Street	Maximum Grade	(feet)
Business or collector street	6%	200
Minor street	10%	150
Lane	12%	125

- (2) Leveling areas. On any street where the grade exceeds 6% on the approach to an intersection, a leveling area with a slope of not more than 4% shall be provided for a distance of at least 50 feet from the nearest edge of the intersecting traveled way. The maximum center-line grade through a cul-de-sac shall be 5%. **[Amended 9-28-1994]**

C. Roadway construction.

- (1) Street grading. Stumps, brush, roots, boulders and like material shall be removed as necessary for the roadway and utilities. Wherever feasible, existing vegetation shall be retained and protected. **[Amended 7-8-1981]**

(a) The full length and width of the proposed roadway pavement area shall be excavated or filled, as necessary, to a depth of at least 15 1/2 inches below the finished surface as shown on the profile. However, if the soil is soft and spongy or contains undesirable material, such as clay, sand pockets, peat, stones over six inches in diameter or any other material detrimental to the subgrade, such material shall be removed and replaced with suitable well-compacted material.

(b) No topsoil suitable for reuse shall be removed from the subdivision unless adequate topsoil will remain on site or is otherwise assured to provide all disturbed areas within the subdivision with a topsoil depth of at least four inches and there is also assurance that all streets from which topsoil is being removed will be brought to subgrade with approved materials within six months.

(2) Finished subbase. **[Amended 7-8-1981]**

(a) Roadways shall be constructed with a foundation of at least eight inches compacted thickness of gravel borrow conforming to Massachusetts Department of **Transportation** ~~Public Works~~ Specification for Highways and Bridges M1.03.0, Type b. The source of this material (with a five-pound sample) shall be made available to the Planning Board engineer. Over this subbase material a four-inch layer of processed gravel conforming to the Massachusetts Department of **Transportation** ~~Public Works~~ Standard Specification for Highways and Bridges M1.03.1 shall be placed.

(b) The gravel shall be spread in two layers, each of which shall be thoroughly watered and rolled true to line and grade with a roller of not less than 12 tons. Any depressions that appear during and after rolling shall be filled with additional gravel and rerolled until the surface is true and even. This surface shall be 3 1/2 inches below the proposed finished grade as shown on the profiles and have transverse grade conforming to that shown on the required cross sections.

(3) Finished pavement.

(a) After the treated roadway base has been subjected to the action of traffic for a time period specified by the Planning Board engineer, but not in excess of 30 days, a binder course of Class I-1 bituminous concrete shall be applied and compacted and rolled to a thickness of two inches with a true surface conforming to the cross section of the road. A second course of Class I-1 bituminous concrete top shall then be applied and compacted and rolled to a thickness of 1 1/2 inches (two inches for business streets) with a true surface conforming to the cross section of the road. Specifications for the composition of

material, workmanship and the method of applying pavement material shall conform to the specifications of the town.

- (b) Pavements shall be constructed for the full length of all streets within the subdivision shown on the plan. The center line of such pavements shall coincide with the center line of the street rights-of-way unless a minor variance is specifically approved by the Board.
- (c) Minimum width of roadway pavements shall coincide with the requirements of Subsection A(1) of this section as determined by the Board.
- (d) Minimum outside diameter of roadway pavement area within turnarounds on dead-end streets, if allowed, shall be 108 feet.

§ 202-14 **Stormwater management.**

- A. General approach. Storm drains, culverts and related facilities shall be designed to permit the unimpeded flow of all natural watercourses, to ensure adequate drainage at all low points along streets, to control erosion and to intercept stormwater runoff along streets at intervals reasonably related to the extent and grade of the area being drained. To the maximum extent feasible, stormwater shall be recharged rather than piped to surface water. Peak **volume and rate of runoff** ~~stream flows and runoff~~ at the boundaries of the development **must not be higher** ~~in a twenty-five year frequency storm shall be no more than 10% higher~~ following development than prior to development. **[Amended 9-28-1994]**
- B. Design basis. Storm sewers shall be based on a **twenty-five year storm, culverts for a fifty-year storm, detention basins for a one hundred-year storm with one foot of freeboard.** ~~ten-year frequency storm, and detention basins and culverts shall be based on a twenty-five year frequency storm, with consideration given to damage avoidance for a one hundred-year storm.~~ **[Amended 9-28-1994]**
- C. Design method. **Design shall be based on runoff method Soil Conservation Service Technical Release No. 20 (SCS TR-20). Refer to the Chelmsford DPW Stormwater Management Regulations for more details on design requirements. The stormwater design must meet all applicable Massachusetts DEP Stormwater Standards.** ~~Design shall be based upon the rational method, the Manning Formula, United States Weather Bureau Technical Paper No. 40, Rainfall Frequency Atlas, Soil Conservation Service Technical Paper No. 149, A Method for Estimating Runoff, and ULI Residential Stormwater Management, 1975, and United States Department of Agriculture Soil Conservation Service Guidelines for Soil and Water Conservation in Urbanizing Areas of Massachusetts, unless alternative methods or sources are approved by the Planning Board engineer.~~ Water velocities in pipes and gutters shall be between two feet and 10 feet per second and not more than five feet per second on ground surfaces. All undeveloped tributary areas shall be assumed to be fully developed in accordance with the Zoning Bylaw. The coefficient of runoff used shall not be less than 0.45 for subdivided areas.
- D. Storm sewers. A catch basin to manhole drain configuration shall be used. All drain pipes shall be at least 12 inches inside diameter and made of reinforced concrete conforming to Massachusetts Department of **Transportation Public Works** specifications for Class III pipe or such higher class as may be required by depth of cover, which shall be not less than 24 inches **or High Density Polyethylene (HDPE) pipe.** ~~PVC pipe (SDR 35 or equivalent) may be approved for use by the Planning Board~~

~~engineer.~~ [Amended 9-28-1994]

- E. Structures. Generally, catch basins will be required on both sides of the roadway on continuous grade at intervals of not more than ~~400~~ 250 feet. Catch basins shall be at least six feet deep and four feet in diameter (inside measurements), with a ~~thirty-inch~~ four foot or greater sump below pipe invert, and shall be constructed of ~~concrete blocks or~~ precast concrete units. Manhole covers and grates shall be in conformance with Massachusetts Department of ~~Public Works~~ **Transportation** specifications, designed and placed so as to cause no hazard to bicycles.
- F. Waterways. Open brooks or tributary ditches which are to be altered shall be shaped to a cross section and gradient and provided with stream bottom hardening, all acceptable to the Planning Board.
- G. Connections. Proper connections shall be made with any existing drains in adjacent streets or easements which prove adequate to accommodate the drainage flow from the subdivision. **Runoff must be treated prior to connecting to the municipal drainage system. No increase in volume will be allowed to the municipal drainage system.** In the absence of such facilities, or the inadequacy of the same, it shall be the responsibility of the developer to extend drains from the subdivision as required to properly dispose of all drainage from said subdivision in a manner determined to be proper by the Board.

§ 202-17 **Sidewalks.**

- A. Where required. Footpaths shall be installed on both sides of collector streets, on both sides of minor streets and lanes in the RC District, based on the Chelmsford Zoning Bylaw, and on one side of minor streets and lanes in other residential districts, unless the Planning Board determines that no sidewalk is appropriate because a continuous system is infeasible or such walk would serve neither pedestrian convenience nor safety. Sidewalks will be required on one side of business streets. [Amended 9-28-1994]
 - (1) In addition, the Planning Board shall, under conditions other than the above, require that the grading of the right-of-way be so executed as to make possible later additions of sidewalks without major regrading.
 - (2) Footpaths shall be not less than five feet in width, except four feet on lanes, and shall be located as close as is feasible to the street side line.
- B. Construction. All materials shall be removed for the full width of the footpath to a subgrade 10 1/2 inches below the finished grade as shown on the cross section, and all soft spots and other undesirable material below such subgrade shall be replaced with gravel (Massachusetts Department of **Transportation** ~~Public Works~~ Specification M1.03.0, Type b) and rolled. The excavated area shall then be filled with gravel (Specification M1.03.0, Type b) and rolled with a cross slope of not less than 1/4 inch nor greater than 3/8 inch to the foot. The footpath shall be constructed of bituminous concrete in two courses consisting of 1 1/2 inches of binder and one inch of finish. All bituminous concrete shall conform to Massachusetts Department of **Transportation** ~~Public Works~~ specifications, as amended. [Amended 9-28-1994]

§ 202-18 Easements.
[Amended 9-28-1994]

Easements for water mains, storm drains, utilities and other purposes and their appurtenances shall be provided where such are located outside the street line and shall be at least 30 feet wide. Where a subdivision is traversed by a natural watercourse, drainageway, channel or stream, the Board may require that there be provided an easement or drainage right-of-way of adequate width to conform substantially to a line 15 feet distant from either side of the watercourse or stream. The Board may require the enclosure of any such watercourse or stream and, in the event of enclosure, may require an adequate easement to service the same. All utility (sewer, water, drain, etc.) pipes, structures and appurtenances shall be designed and constructed so as to be accessible by equipment necessary for the future operation and maintenance of the facilities.

§ 202-19 Open space and planting.

- A. Reservation of open space. Where it believes proper and subject to governing statutes, the Board may require the plan to provide open areas suitably located for parks, for playground or recreational purposes or for other required public facilities. Such areas shall not be unreasonable in area in relation to the land being subdivided and to the prospective public use of such land. The Board, by appropriate endorsement on the plan, may restrict the erection of a building or buildings upon such reserved areas for a period of three years without its written approval. **Low Impact Development (LID) features can be located within the open space.**
- B. Preservation of trees. No trees over four inches in diameter shall be removed from a subdivision or a lot within a subdivision and no grading of a subdivision or a lot within a subdivision shall be undertaken until the Department of Public Works of the town has marked those trees of such size that may or shall be removed and those trees of such size that must be welled in order to ensure their preservation following grading.
- C. Shade trees. Such trees as are suitable, in the opinion of the Board, for preservation shall be preserved. Where, in the opinion of the Board, existing trees are inadequate, shade trees having a diameter of at least two inches and of a variety suitable, in the opinion of the Board, shall be planted. Such planted trees shall usually be spaced not more than 40 feet apart, in 1/2 cubic yard of topsoil satisfactory to the Board.
- D. Planting space. There shall be a planting space between the curblineline of the roadway and the footpath or street sidewalk. Said area shall be surfaced with not less than six inches of topsoil, which shall be seeded and rolled to the satisfaction of the Board. **Low Impact Development (LID) features can be located within the Right-of-way.**
- E. Grading of slopes of streets. All slopes resulting from grading of streets are to be graded to a slope not steeper than 2:1 in cut and 3:1 in fill nor more than 3/4:1 in ledge. Slopes and other areas where topsoil has been removed shall be loamed with a topsoil satisfactory to the Board to a depth of at least six inches, seeded with a permanent grass mixture and rolled. In the event that such slopes cannot be contained within the street side lines, the subdivider shall reserve slope easements wherever feasible. If retaining walls are necessary in the opinion of the Board, they shall be constructed of reinforced concrete, stone, brick or other materials deemed suitable by the Board.

§ 202-21 Curbing and berms.
[Amended 7-8-1981; 9-28-1994]

In some subdivisions, the Board may require infiltration trenches (see the required cross section detail) along the edge of asphalt pavement for lanes, minor streets, collector streets and business streets. In all cases sloped granite curbing shall be required. All granite curbing, where required, shall be sloped granite curbing comparable to Massachusetts Department of ~~Transportation Public Works~~ Specification M9.04.2, Type SB. When used on a radius of 20 feet or less, curb shall be cut with radial joints. Workmanship and method of setting shall conform to the specifications of the Massachusetts Department of ~~Transportation Public Works~~. Where curbing is not required, Class I bituminous concrete berms shall be placed in accordance with Massachusetts Department of ~~Transportation Public Works~~ Specification 470.

§ 202-22 Guardrails.
[Amended 9-28-1994]

Guardrails or similar devices for keeping vehicles on the road shall be installed where deemed necessary by the Board and shall be capable of withstanding without displacement the impact of an automobile traveling five miles per hour and of being readily seen by drivers. Guardrails shall conform to Massachusetts Department of ~~Transportation Public Works~~ specifications.