

SECTION 7:00
DESIGN STANDARDS

The Planning Board may disapprove a subdivision plan where, in the opinion of the Board, the existing surrounding municipal infrastructure (eg. street width and construction, sanitary sewer, public water, storm sewer, etc.) is sufficient and/or incapable of handling the additional volumes (eg. traffic, sewage, storm water, etc.) anticipated by the Board to be generated by the development.

Streets, sidewalks, water systems, sanitary sewers, storm drain systems, public and private utilities, and other infrastructure shall be constructed in accordance with this chapter and Section 8:00, Construction Standards.

7:01 Streets and Ways.

Streets and ways shown on the subdivision plan must comply with the following requirements:

1. **Location.**

- a. All streets and ways shall be designed so that in the opinion of the Board, they will provide safe vehicular travel. Due consideration shall also be given by the subdivider to the attractiveness and design of the street layout in order to obtain the maximum livability and amenity of the subdivision. As far as practicable, streets should also follow natural contours. Streets and lot lines shall be drawn so as to afford access to sunlight for energy efficient house siting and building wherever possible.
- b. Roads within a subdivision shall conform with any Master Plan that has been adopted by and is in effect within the Town.
- c. Provision shall be made, to the satisfaction of the Board, for the projection of streets or for access to adjoining property which is not yet subdivided or developed. A right-of-way from the end of all cul-de-sacs and dead-end roads to adjoining property must be part of the street layout and must be shown on street acceptance

plans and deeds unless there is compelling evidence, in the opinion of the Board, that the adjoining property will never be developed.

- d. Temporary dead-end or cul-de-sac streets shall conform to the provisions of alignment, width and grade that would be applicable to permanent dead-end or cul-de-sac streets.
- e. The developer shall make every effort to avoid the creation of dead-end streets and must connect the subdivision roadways to existing streets whenever possible.

2. **Alignment.**

- a. Horizontal and vertical alignment shall be in accordance with the standards as shown in Section 7:01.9.
- b. Local streets in residential subdivisions shall be laid out so that not less than two thirds (2/3) of the length of every street shall consist of curves, not including turnarounds at the ends of dead-end streets and no straight segment shall be longer than three hundred feet.

3. **Grade.** Grades shall be in accordance with the standards as shown in Section 7:01.9.

4. **Intersections.** Streets shall be laid out so as to intersect in accordance with the standards as shown in Section 7:01.9 and the following:

- a. Street and layout lines at all intersections between proposed streets or between a proposed and/or existing street, shall be rounded with a curve at each corner which has a property line radius of not less than thirty (30) feet.
- b. The centerline of all intersecting streets shall be a straight line from the point of intersection between centerlines for a distance of no less than one hundred (100) feet.

- c. On any street where the grade exceeds two (2) percent on the approach to the intersection, a leveling area with a maximum slope of two (2) percent shall be provided for a distance of not less than thirty (30) feet, measured from the nearest gutter line of the intersecting street.
- d. Streets entering opposite sides of another street shall be laid out either directly opposite each other or with a minimum offset of one hundred fifty (150) feet between their centerlines. This minimum offset shall also be observed whenever one or more streets entering opposite sides of another street are existing, whether located within or outside the boundary of the proposed subdivision.
- e. Streets entering the same side of another street shall be laid out with a minimum offset of one hundred fifty (150) feet between their centerlines. This minimum offset shall also be observed whenever one or more streets entering the same side of another street are existing, whether located within or outside the boundary of the proposed subdivision.

5. **Cul-de-Sac or Dead-End Street.**

- a. No street in a proposed subdivision shall be laid out in such a manner that an obstruction at any point on this street, or any other street with which it intersects, would isolate, without another point of exit, more than five hundred (500) feet of roadway as measured along the centerline of the road or roads. The length of the cul-de-sac shall be measured along the centerline of construction from its beginning to the center of the turnaround.
- b. Permanent cul-de-sac streets shall be provided with a turnaround at the end of the street having a minimum island radius of forty (40) feet and a property line radius of at least eighty (80) feet. The center of the cul-de-sac shall be on the centerline of construction (see Appendix A). In certain cases, based on existing topography,

the Planning Board might approve a hammerhead at the end of a street (see Appendix A).

- c. A permanent cul-de-sac island shall be constructed in lieu of paving the entire area of the cul-de-sac. The roadway pavement around the island shall have the same width as the roadway leading into the cul-de-sac (see Appendix A). The island shall be graded, seeded and/or appropriately planted with acceptable trees or shrubs, or left with natural tree growth. The maintenance of said island shall be the responsibility of the developer, his successors and assigns, or a homeowner's association.
- d. A temporary cul-de-sac, a hammerhead or temporary turnaround shall be allowed only where, in the opinion of the Board, it is essential to the reasonable development of the subdivision and where it is part of a street that eventually will be extended into adjoining property. The design of a temporary turnaround shall be satisfactory to the Board and clearly shown on the plan as temporary in nature and such property lines shall be those which would normally have been required or used without the turnaround.

Regardless of the above, no temporary cul-de-sac shall be allowed if the street length exceeds the limit set in these Rules and Regulations.

Layout of the turnaround beyond the normal street layout lines shall be in the form of an easement to the subdivision's homeowners association, when the street is extended into adjoining property, the easement shall become null and void.

6. **Street Cross Sections.**

- a. Cross sections shall be in accordance with the standards shown in Appendix A.
- b. Only the typical cross section need be shown on the Definitive Plan if the former conforms to the standard mentioned above. Any variation from the typical standard should be shown on the

construction plans at fifty (50) foot intervals.

7. **Right-of-Way Width.** The right-of-way width shall be sixty (60) feet. Greater width may be required by the Board when deemed necessary to accommodate commercial traffic.

8. **Paved Roadway Width.** The roadway width shall be based on the following criteria:

a. Projected traffic volume generated by the development based on ten (10) average daily trips (ADT) per dwelling unit (i.e., a two family house will generate 20 ADT).

b. The maximum number of vehicles based on the above mentioned ADT per dwelling unit, whether generated within the development (as in the case of a dead-end street) or outside of the development (as in the case of a through street) and passing any section of a roadway, will determine the width of the entire length of said roadway based on the standards shown below:

	<u>Pavement Width</u>
Type A: Street with total ADT less than 200	24'
Type B: Street with total ADT less than 500	26'
Type C: Street with total ADT less than 2,000	28'
Type D: Street with total ADT more than 2,000	30'

c. In establishing the proposed road width the developer shall also consider the future growth of the surrounding area.

- d. The centerline of the roadway shall coincide with the centerline of the right-of-way, unless otherwise approved by the Board.
- e. Greater widths may be required by the Board when deemed necessary to accommodate present and future traffic (including commercial vehicles). This may include widening and upgrading existing streets at close proximity to or adjoining the subdivision.

9. **Street Standards.**

	<u>Local</u>	<u>Collector</u>	<u>Major</u>
<u>Horizontal Alignment</u>			
Minimum radius of centerline	100'	300'	500'
Minimum tangent between reverse curves	50'	100'	150'
<u>Vertical Alignment</u>			
Minimum stopping sight distance at three and one half (3.5) feet above pavement	150'	200'	250'
<u>Grade</u>			
Maximum	9%	9%	6%
Minimum	.75%	.75%	.75%
<u>Intersection</u>			
Intersection angles (degrees)	90	90	90
Minimum sight distance (at stop controlled or obstructed view intersection)	300'	300'	550'
Minimum radius at edge of roadway	25'	30'	30'

7:02 Easements.

For municipal utilities (water, drain, sanitary) easements shall be thirty (30) feet wide, except that wider easements

may be required by the Board where necessary. Utilities shall be located as close as possible to the centerline of the easement.

7:03 Open Space.

Before approval of a plan, the Board may require the plan to show a park or parks suitably located for playground or recreation purposes or for providing light and air. The park or parks shall not be unreasonable in area in relation to the land being subdivided and to the prospective uses of such land. The Board may, by appropriate endorsement on the plan, require that no building be erected upon such park or parks without its approval for a period of three years after its endorsement of the Definitive Plan.

7:04 Fencing.

The Board may require appropriate fencing whenever industrial/commercial areas abut residential areas.

7:05 Protection of Natural Features.

Due regard shall be shown for the protection of all natural features such as trees, watercourses, scenic points, historic spots and structures and similar community assets which, if preserved, will add attractiveness and value to the subdivision and to the community.

7:06 Guard Rails.

Guard rails shall be provided at points of hazard along the roadway such as fixed objects at the pavement edge, high fills, fills on sharp curves, along water courses, steep cliffs, along deep ditches and other similar locations as required by the Board.

7:07 Sidewalks.

Sidewalks shall be constructed between the traveled roadway and the layout line as follows:

1. Major streets: both sides
2. Collector streets: both sides, or as specified by the Board.

3. Local streets: one side, or as specified by the Board.

7:08 Wheelchair Ramps.

All sidewalks shall be handicapped accessible from the roadway at all intersections. Wheelchair ramps shall be designed and constructed according to the Commonwealth of Massachusetts Department of Public Works "Construction Standards" 1977 Edition, as amended.

7:09 Grass Plots and Trees.

1. The entire width of the right-of-way, except for roadway, curb, gutter and sidewalk, shall be finished with at least six inches of good quality loam, rolled and seeded with seed mix approved by the Planning Board.
2. No utility poles, transformers, signs or other obstructions shall be placed less than two feet from the edge of the paved roadway.
3. Where, in the opinion of the Planning Board, existing or proposed trees on the adjacent lot are not adequate, planting of street trees in the grass plot may be required. Species, size and planting specifications shall conform to current practices of the Town for street tree planting.

7:10 Water Supply.

1. **General.** It is the intent of the Town of Williamsburg that adequate water supply for both domestic use (meeting all State and local health requirements) and fire prevention must be made available within limits of any subdivision.
2. **Approved Water Systems.** Only the following shall constitute approved water systems:
 - a. For domestic use and/or fire protection a common, piped distribution system connected to the Town's existing public water supply.
 - b. For domestic use a private on-lot water system (well) for each lot.

- c. For fire protection cisterns, ponds or other approved storage facilities.

A subdivider may use any combination of the above to meet the Town's requirements.

- 3. **Common Distribution System.** Where a public water system is located within five hundred (500) feet of the subdivision, the subdivider shall connect to the public water system. Any portion of said system within the limits of the subdivision, which cannot provide a minimum working pressure of thirty-five (35) psi (this value reflects the Department of Environmental Protection's guidance for water systems) shall be grated and laid dry.

- 4. **Fire Prevention.** The criteria for approved water system (see 7:11:2a and 7:11:2c) capable of providing the subdivision with adequate fire flows are as follows:

- a. A piped, common distribution system must be capable of delivering the required fire flows shown below in gallons per minute (gpm), at twenty (20) pounds per square inch (psi), for a minimum of one (1) hour during periods of average daily demand. The table is based on the recommendations of the Insurance Association (Fire Protection Handbook) and the National Fire Code, Vol. 8, pg. 1231.

<u>Minimum distance between Structure</u>	<u>Fire flow (gpm) =</u>
over 99 feet	500
70 to 99 feet	750
11 to 69 feet	1000
10 or less feet	1500

Such a system must be designed to prevent the possibility of backflow infiltration into the municipal system during periods of fire demand.

- b. Cisterns, ponds or other approved storage facilities must be capable of supplying enough volume of water to fight fire for one hour based on the table shown above.

7:11 Sanitary Sewer System.

1. **General.** It is the intent of the Town of Williamsburg that, whenever possible, a developer must provide the subdivision with a sewer system, which will be connected to the Town's existing sewer collection system.
2. **Approved Sewer Systems.** Only the following shall constitute approved sewer systems:
 - a. Private on-lot septic systems for each lot.
 - b. A common, gravity sewer system, connected to the Town's existing sewer collection system.
3. **Common Sewer System.** Where a public sewer system is located within five hundred (500) feet of a subdivision, the subdivider shall connect the development to the public sewer, provided that can be accomplished without the aid of a pumping station.

7:12 Provisions for Groundwater Recharge.

To the extent it is feasible, storm water shall be recharged to groundwater rather than piped to surface water bodies or streams. Where the water table is not too high and the soil is relatively permeable, storm water drainage systems shall feature grassed swales, retention ponds and multi-use areas. Open drainage via grassed areas will be preferred as providing better filtration than pits and shafts. Retention ponds in which there is always some water will be preferred as more attractive and useful than detention basins in which water stands temporarily.