1. **DESIGN STANDARDS**

**To the fullest extent reasonable and practicable, all subdivisions shall be designed and constructed to incorporate the most recent design standards, best practices, policies and design elements of:**

* **Complete Streets (see Appendix C.).**
* **Healthy Communities (see Appendix D.).**
* **Stormwater Management (see Appendix E.).**

**5.1 Streets**

5.1.1 Location and Alignment

5.1.1.1 All streets in the subdivision shall be designed so that, in the opinion of the Board, they will provide safe and convenient access for all users of all ages and abilities, by all modes of transportation including pedestrians, bicyclists, motorists, public transportation users, and delivery and emergency vehicle operators. Due consideration shall also be given by the subdivider to the attractiveness of the street layout; in order to obtain the maximum livability and amenity of the subdivision as well as connections to existing and planned public ways, vehicular, pedestrian and bicycle facilities, and connections to adjacent ways and properties. Where minimum standards are not herein specified, the latest edition of AASHTO (American Association of State Highway and Transportation Officials) A Policy on the Geometric Design of Highways and Streets shall apply.

5.1.1.2 Provision shall be made, which is satisfactory to the Planning Board, for the proper projection of streets and ways for bicycles and pedestrians, or for access to adjoining property which is not yet subdivided or developed.

5.1.1.3 Reserve strips prohibiting access to streets or to adjoining, property shall not be permitted without expressed approval of the Board.

5.1.1.4 Dead-end streets (cul-de-sac) are discouraged and shall be permitted as minor streets only. Developers should make every effort to avoid the creation of dead-end streets and should connect proposed subdivisions to existing dead end streets wherever reasonable and practicable.

A. A developer may demonstrate that a dead end streets is appropriate when they can demonstrate that a future connection to an existing street is not possible or practicable, or when the surrounding property will never need a street connection because of extremely sensitive or permanently protected natural resources. In this situation the project must provide a viable pedestrian and bicycle connection to the surrounding property as appropriate.

B. Where the Board has approved a proposed development of a dead end street that ends in a cul-de-sac, the cul-de-sac shall have a circular turning radius of not less than 60 feet or a maximum of 100 feet (measured at the center-line), and a property line radius of at least 85 feet. They shall in all additional ways conform to the same requirements as any other street. The length of a dead-end street allowed by right is a maximum of one thousand feet (1000’) as measured along the centerline of construction of the street from the edge of the development’s property line nearest the connecting existing public street which is not itself a dead-end street to the middle of the cul-de-sac.

C. All cul-de-sac streets shall have turnaround islands that are planted with trees and/or other vegetation or left with natural tree growth in lieu of paving the entire area of the cul-de-sac (see Section 6.13.4). The maintenance of the inner circle shall be the responsibility of the developer, his successors and assigns, or a homeowners’ association.

5.1.1.5 Horizontal curves on the street centerline shall not begin or end within one hundred and fifteen (115) feet of the centerline of the intersecting street.

5.1.1.6 Streets entering on opposite sides of another street shall be laid out directly opposite each other; or with a minimum offset of 200 feet between their respective centerlines.

5.1.1.7 The centerline of the roadway shall coincide with the centerline of the right-of-way unless otherwise approved by the Board. The distance from the edge of pavement to the edge of the right-of-way shall be equidistant from the center-line of the roadway.

5.1.2 Road Design Standards

Street standards shall be provided in accordance with the following tables.

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| **LOCATION AND ALIGNMENT** |
|  | **Type I Subdivision and Minor/Secondary Streets** | **Type II & III Subdivisions and Major/Collector Streets** |
| Minimum Right-of-Way width (in feet) | 60 | 70 |
| Horizontal Alignment Minimum radius of center line (in feet)  | 250 | 500 |
| Vertical Alignment Minimum stopping sight distance at three and one-half (3.5) feet above pavement (feet)  | 200 | 275 |
| Grade  |  |  |
| * Maximum (percent)
 | 8 | 5 |
| * Minimum (percent)
 | 1 | 0.75 |
| Intersection |  |  |
| * Intersection angles (degrees)
 | 90 | 90 |
| * Minimum sight distance (in feet) (at stop-controlled or obstructed-view intersection)
 | 300 | 550 |
| * Minimum Distance center line of road shall be straight when approaching an intersection
 | 115’ | 115’ |
| * Max. grade for 30’ approaching an intersection
 | 2% | 2% |
| * Minimum radius at edge of roadway pavement (in feet)
 | 25 | 55 |
| * Minimum Radius at edge of right-of-way
 | 25 | 55 |

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| **ROADWAY CONSTRUCTION** |
|  |  |
| **Bituminous Concrete**  | **Type I Subdivision** | **Type II Subdivision** | **Type III Subdivision** |
| * Top Course\*
 | 1.5” | 2” | 1.5” |
| * Binder Course\*
 | 2” | 3” | 1.5” |
| * Base Course\*
 | - | - | 3" |
|  |
| **Type I, II & III Subdivisions** | **Subgrade Soil Type** **(as defined by the USDA/NRCS Soil Survey and determined by soil borings)** |
| Gravel Sub-Base  | **Severe/Poor** | **Moderate/Medium** | **Good/Excellent** |
| * Processed gravel\*
 | top 4” | top 4” | top 4” |
| * Gravel base\*
 | 25” | 14” | 14” |
| * Geotextile Road Fabric shall be placed under the gravel sub-base when the subgrade soil contains clay
 |  |  |   |
| \*shall comply with Massachusetts Department of Transportation Specifications for Highways, Bridges and Waterways (latest edition) |

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| **PAVEMENT WIDTH** **(Face of Berm-to-Face of Berm)** |
|  | **Type I Subdivision** | **Type II & III Subdivisions** |
| Proposed street with MDTVP\*\* of not greater than 100 ADT\* | 22’ | 32’ |
| Proposed street with MDTVP\*\* of not greater than 200 ADT\* | 24’ | 32’ |
| Proposed street with MDTVP\*\* of not greater than 500 ADT\* | 26’ | 32’ |
| Proposed street with MDTVP\*\* of not greater than 2,000 ADT\* | 28’ | 32’ |
| Proposed street with MDTVP\*\* exceeding 2,000 ADT\* | 32’ | 32’ |
| Pavement width within 30’ of each intersection | 24’ | 32’ |
| \*Projected traffic volume anticipated to utilize the proposed subdivision developments roadway(s) based on ten (10) average daily trips (ADT) per dwelling unit (i.e. a two-family house will generate 20 ADT).\*\*The Maximum Daily Traffic Volume Projected (MDTVP) shall be based on the above-mentioned ADT per dwelling unit, and shall include all traffic and all traffic types expected to utilize said street, whether generated within the development (as in the case of a dead-end street) or outside of said development (as in the case of a through street) and passing any section of a roadway, and shall determine the width of the entire length of said roadway. In establishing the proposed road width, the developer shall also consider the future growth of the surrounding area, and its utilization of these streets. |

5.1.3 Adequate Access from Public Way

5.1.3.1 When the physical condition or width of a public way from which a Subdivision has its access is considered by the Board to be inadequate to carry the traffic expected to be generated by such Subdivision, the Board may require the Applicant to dedicate a strip, of land for the purpose of widening the abutting public way to a width at least as great as that required within the Subdivision, and to make physical improvements to and within such public way to the same standards required within the Subdivision. Any such dedication of land for purpose of way and any such work performed with such public way be made only with permission of the governmental agency having jurisdiction over such way, and all costs of any such widening of construction shall be borne by the Applicant. Such frontage shall be of at least such distance as is then required by zoning or other ordinances for the erection of a building on such lot. Conveyances or other instruments adding to, taking away from, or changing the size and shape of lots in such a manner as not to leave any lot so affected without the frontage above set forth, or the division of a tract of land on which two or more buildings were standing when the Subdivision Control Laws went into effect in the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into separate lots on each of which one such building, remains standing, shall not constitute a subdivision.

5.1.3.2 The Board may disapprove of a subdivision plan where, in the opinion of the Board, the existing surrounding municipal infrastructure (e.g. street width and construction and necessary utilities) is insufficient and/or incapable of handling the additional volumes (e.g. traffic, storm water) anticipated, by the Board, to be generated by the project. Board may accept or require off-site improvements to mitigate any of these impacts.

**5.2 Easements**

5.2.1 Easements for utilities shall be located around the individual lot’s perimeter wherever possible. They shall be contiguous from lot to lot. Easements shall be at least 20 feet in width.

5.2.2 Where a subdivision is bisected by or adjacent to a watercourse either natural or manmade, the Board may require that there be a storm-water or drainage easement of at least 20 feet in width to conform to the path of the watercourse, and to provide for any construction related to that watercourse.

5.2.3 The Board may require an easement for watercourse that are not within a subdivision but may be affected by it.

5.2.4 The Board may also require an easement at any place it deems necessary to protect the health and safety of the inhabitants of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5.2.5 All easements, including their purpose, shall be shown on the Definitive Subdivision Plan and placed on the parcel(s) deed.

**5.3 Protection of Natural Features**

All significant natural features such as: large trees, watercourse and wetlands, as well as scenic and historic areas shall be preserved where possible and practicable. These features add to both the attractiveness, and economic value of the subdivision and the [Town/City].

**5.4 Open Spaces**

Before approving a Definitive Plan for a subdivision, the Board may require that a section of that land be set aside for possible use as a park or a playground. The Board may require that no building be erected upon such area until the land is either purchased by the [Town/City], or is deeded in gift to the [Town/City] or to a neighborhood civic association. This land may be held in said status for a period of 3 years, at which time if the land is not deeded or purchased it may be included in a new subdivision proposal.

**5.5 Stormwater Management & Erosion and Sediment Control (See Appendix E.)**

The storm water management system shall be designed to incorporate and address the stormwater management for the entire proposed development, including anticipated buildout of individual lots.

5.5.1 All subdivision designs must meet the Stormwater Management and Erosion Control Design and Performance Standards in the Stormwater Management [Bylaw/Ordinance], Section \_\_\_\_\_ of the [General/Zoning] [Bylaws/Ordinances] for the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Appendix E. of these regulations.

5.5.2 Erosion and sediment controls must be implemented during construction, as delineated in Section \_\_\_ of the Stormwater Management [Ordinance/Bylaw] for the [Town/City] of \_\_\_\_\_\_\_\_ and Appendix E. of these regulations.

5.5.3 All stormwater management systems must have an Operation and Maintenance (O&M) Plan to ensure that systems function as designed, in accordance with Section \_\_\_\_ of the Stormwater Management [Ordinance/Bylaw] of the [City/Town] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Appendix E. of these regulations.

5.5.4 All tributary areas shall be assumed to be fully developed in accordance with the \_\_\_\_\_\_\_\_\_ Zoning By-Law/Ordinance unless publicly owned or deed restricted. Water velocities in pipes and paved gutters shall be between two (2) and ten (10) feet per second, and not more than five (5) feet per second on unpaved surfaces. Facility design shall be as follows:

* Street surface drainage (storm sewers, swales) – 25 year storm
* Detention basins – 100 year storm
* Watercourses, drainage ways, channels or streams – 100 year storm
* Culverts, bridges, other water crossings – 100 year storm

5.5.5 All permanent storm water control structures (including but not limited to detention/retention ponds, oil/water separators, weirs, etc.) should be located on separate parcels placed under the ownership, control, responsibility and liability of a Homeowner’s Association comprised of the property owners of this subdivision, or another entity that the Planning Board deems acceptable. An easement shall be granted to the entity owning the street (including its successors and assigns) authorizing the discharge of storm water into said stormwater retention area. Sufficient draft legal documentation creating said Association, and its rules and regulations, including the aforementioned and following responsibilities, shall be submitted to and approved by the Planning Board prior to their endorsing the approved definitive plan. Final legal documents must be submitted to and approved by the Planning board prior to recording and prior to the sale of any lots. Said Association shall be responsible for:

* the maintenance, repair, and improvement of the storm water drainage structure ensuring its continued functioning capability as designed and constructed
* maintaining a bank account at all times, with a balance of no less than an amount determined by the Department of Public Works Director as being sufficient, for the purpose of paying for said maintenance and improvements
* maintaining an insurance policy in an amount of at least one million dollars ($1,000,000.00)
* having said structure inspected, and maintained, repaired and improved as needed, at least once a year by a qualified person/firm (i.e. engineer, landscaper as appropriate)
* having said qualified person/firm forward a written report, at least once each calendar year, certifying said inspection and any maintenance, repairs, and improvements that were required and undertaken to the Planning Board and Department of Public Works Director
* maintaining any planted cul-de-sac islands or boulevards

The Homeowner’s Association documents shall also include wording providing that, should said association fail in any of its aforementioned responsibilities as listed above, granting the town the right to intercede and conduct any of the maintenance, repairs and improvements that it feels are necessary to ensure the proper functioning of the structure, and assess the association and/or the association’s individual members, the cost of said maintenance, repairs and improvements, plus a 20% administrative fee. In addition, an easement permitting such access and activities by the town shall be included on the definitive subdivision plan and the deeds to the Homeowner’s Association’s properties and its individual member’s properties which are part of the development.

5.5.6 Apart from the area for roads and the storm water system, there shall be no exposed and unstable soil, unless specifically authorized by the Board upon recommendation from the Conservation Commission and Department of Public Works Director (or his designee).

5.5.7 Storm water shall not be permitted to sheet flow across the surface of the roadway. It must be piped underneath.

5.5.8 Catch basins shall be placed on both sides of the street. They shall be placed at street intersections to intercept stormwater runoff.

5.5.9 The maximum distance between catch basins shall be 300 feet.

5.5.10 The minimum diameter of storm drainage pipes shall be 12 inches.

5.5.11 The method of construction and the materials used in construction shall conform to the most recent Massachusetts Department of Transportation, Standards and Specifications

for Highways, Bridges and Waterways.

**5.6 Sewerage**

5.6.1 If a subdivision is within 500 feet of the public sewerage system, the developer shall be required to connect all new homes as part of the proposed plan to that system according to the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Construction Standards.

5.6.2 If a subdivision is within 500 feet of a planned public sewerage system, the developer shall be required to install a sewer main and laterals, according to the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Construction Standards in order to connect to the planned sewer in the future. The planned public sewerage system shall have been adopted at a previous [Town/City] Meeting and shall be scheduled to be built no more than 5 years from the date of submission of a Definitive Plan.

5.6.3 The subdivision shall be designed to be in compliance with the rules and regulations of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sewer Commission, in effect at the time of definitive plan approval.

5.6.4 Where a public sewerage system connection is not feasible (according to the above rules), a private on site sewerage system shall be designed and constructed in conformity with the Title V Regulations of the Commonwealth of Massachusetts and subject to the approval by, and in conformity with the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Board of Health and its Rules and Regulations.

**5.7 Water**

5.7.1 To insure the health and safety of inhabitants, the subdivider shall connect all proposed subdivisions to the public water supply system if available.

5.7.2 Private on-lot water systems shall be constructed in accordance with the Title V Regulations of the Commonwealth of Massachusetts. It shall be subject to the approval of the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Board of Health.

5.7.3 All connections to the public water supply shall be built in accordance with the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, Water Department Regulations at the time of construction.

5.7.4 There shall be no use of water hydrants for construction purposes without the prior written approval of the Water Department.

**5.8 Access Through Another Municipality**

At least one point of access to a subdivision must be within the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

If additional access to a subdivision crosses land in another municipality, the Board may require certification from appropriate authorities that such access is in accordance with the Master Plan and subdivision requirements of such municipality and that a legally adequate performance bond has been duly posted or that such access is adequately improved to handle prospective traffic.

Any subdivision with lots located in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ must be serviced and accessible by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Road so that emergency and maintenance vehicles can service the lots without having to leave \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**5.9 Relationship to [Town/City] Plans**

The design and layout of a proposed subdivision should be guided by the goals and objectives of any existing Community Development plans, master plans, village plans, or statements of goals and objectives for the [Town/City] of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.