

Effective Date: 5/1/04

SECTION 04. SUBDIVISION DESIGN REQUIREMENTS

04.01. GENERAL PLANNING AND DESIGN

04.01.01. Character of Subdivision Land

- 1) Proposed building lots shall be of such shape, size, location, topography and character that buildings can be constructed reasonably, occupied and used for building purposes without danger to the health, safety and general welfare of the occupants and the public. Proposed building lots shall be designed and arranged to make the best use of the natural terrain, to avoid unnecessary regrading, to protect the natural environment and to preserve natural features such as ridge lines, water bodies, watercourses, and vegetation. The proposed grading of a lot which involves the creation of steep slopes and/or banks which result in changes of grade in excess of fifteen (15) feet and at a slope of 1:1 or greater, or mining of bedrock in excess of one (1,000) thousand cubic yards, or excavation and/or filling in excess of five (5) feet in depth over sixty (60) percent of the lot shall be considered inconsistent with this section and a possible threat to public health and safety and shall be subject to the provisions of 03.05.30).
- 2) Land unsuitable for building purposes due to conditions such as difficult drainage, configuration, inaccessibility, temporary flooding, erosion, steeply sloping topography, swamps, high groundwater level or because of potential danger to health or public safety or peril from fire or floods, shall not be platted for residential or other uses that may increase danger to health, life, or property, or aggravate the flood hazard, unless appropriate corrective measures have been taken by the subdivider to eliminate such hazards in accordance with the applicable provisions of these regulations.
- 3) Except for open space areas specifically approved by the Commission, no land that is rendered useless for building due to easements, watercourses, topography, or failure to meet public health code requirements for on-site sewage disposal or water supply shall be shown as a lot on any subdivision plan. Such lands shall be included in adjoining lots.
- 4) Work on any proposed building lot requiring the excavation and removal of more than 1,000 cubic yards of any earth or mineral

product shall comply with Section 12.05., Sand and Gravel Pits, of the Durham Zoning Regulations.

#### 04.01.02. Reserve Strips

No privately owned, reserved strip of land shall be permitted which would control or impede access to any part of the subdivision or adjacent land from any street or open space reserved for dedication or for any other use.

#### 04.01.03. Preservation of Natural Features

The general layout and design of the subdivision shall avoid, to the maximum extent possible, large scale changes in topography and watercourse locations. The applicant shall demonstrate a conscious effort to preserve and enhance natural features, such as vegetation, watercourses, paths, scenic points, ridge lines and other natural assets. Particular attention shall be given to preserving selected trees and shrubs.

#### 04.01.04. Landscaping

The natural features of the site shall be preserved to the fullest extent possible and the felling of trees shall be held to a minimum. The developer shall leave not less than two (2) naturally growing shade trees having a 1 1/2 - 2 inch or larger caliper in the front yard of each lot or shall plant two (2) shade trees of similar caliper approximately ten (10) feet from the front property line, so that the planting of such trees shall not conflict with the placement of underground utilities. The above shall be shown on the site plan or on a landscaping plan.

Street trees having a 1 1/2 - 2 inch caliper shall be planted along both sides of the street line, spaced approximately fifty (50) feet apart. Again, the spacing of such trees shall not conflict with the location of underground utilities.

In lieu of the above, the Commission may consider the existing vegetation found on the site.

The above requirements shall be imposed on all subdivisions or resubdivisions on existing and proposed streets.

On any thoroughfare requiring a center island, a landscaping plan showing such island shall be submitted as part of the subdivision plan. Plantings and landscaping requiring a minimum amount of maintenance shall be proposed for center islands.

#### 04.02. OPEN SPACE

The purpose of this Section is to ensure that the Town is able to preserve areas containing significant natural features as well as areas designated for use as open space or for recreational purposes. To implement the above, the Commission shall review the subdivision application and determine if open space dedication is warranted based on the criteria outlined in Section 04.02.01. The Commission shall also determine which of the following methods of dedication shall be appropriate (in no case shall the Commission require more than ten (10) percent of the total subdivision area):

- (1) The dedication of land to the Town of Durham or another entity approved by the Planning and Zoning Commission, such as a land trust or association of the subdivision lot owners; or
- (2) The preservation of land in the form of scenic or conservation easements; or
- (3) A combination of the above which the Commission may deem appropriate.

In general, the outright dedication of land shall not be required by the Planning and Zoning Commission unless it is adjacent to an existing Town-owned open space parcel or property dedicated for recreational use.

If the applicant is able to demonstrate that the open space dedication would reduce the total number of lots in the subdivision, that portion of the open space dedication shall be reduced so that the lot yield will not be affected.

##### 04.02.01. Open Space Objectives

The following objectives should be used as a guide in the general layout of a proposed subdivision containing public or private open space:

- (1) Open space, conservation areas and recreation areas shown in the Town's Plan of Development should be considered in the subdivision layout;
- (2) Natural features and vegetation, such as ridge lines, areas of archeological significance, wildlife corridors, wetland areas, stream belts, aquifers or other areas with natural

significance, as found on the site or as outlined in the Town's Plan of Development should be preserved;

- (3) Property adjacent to existing Town-owned open space or recreation areas should be expanded wherever possible.

#### 04.02.02. Standards for Open Space

- (1) The Commission may require open space areas to abut a public street or have direct access to a public street via a right-of-way or easement dedicated to public use.
- (2) When a property line of a subdivision abuts an existing park, or open space, the Commission may require new open space lines to be a continuation of the existing open space to form a single, large, unified area.
- (3) Any land dedicated to the Town for a public playground or park, that is improved for recreational purposes, shall be graded to properly dispose of surface water and landscaped in a manner consistent with the intended use. All brush and debris shall be removed and the land left in a condition for the purposes intended.
- (4) The Commission shall have final approval of the layout of any open space areas to be dedicated to the Town.
- (5) All improvements on a parcel to be deeded to the Town shall be included in the total amount to be bonded for subdivision improvements.

#### 04.02.03. Alternative Open Space Dedication

- (1) If, in the judgment of the Commission, the required open space may be properly and more advantageously located in a future section of a development, the Commission may grant a delay of this provision provided the developer shall provide preliminary plans and enter into an agreement to dedicate the area of land in the future section for open space. The Commission shall require a deed or easement to be executed for the land prior to final approval of the subdivision plan.

If the future section is not planned for development within five (5) years of the date of the subdivision approval, the developer shall deed the required open space land to the Town (either by outright dedication or easement). A right-of-way providing access to the property shall also be included in the dedication. This covenant shall be binding upon the developer and any subsequent owners of the remaining land.

- (2) Open space land to be deeded to the Town, by either outright dedication or easement, need not necessarily be contiguous with the parcel being subdivided. Other property may be suggested by the developer and accepted by the Commission if, in the Commission's judgment, community needs will be better served. Such land must be in the control of the developer.

#### 04.02.04. Exceptions

The Commission may waive the requirements of this section if the minimum total parcel size proposed for subdivision is less than ten (10) acres.

#### 04.03. LOT DESIGN

Building lots should be arranged and located to create and preserve unique characteristics for the building sites, to utilize the existing topography to the maximum degree possible, to maximize the environmental privacy of each building site, to provide each building site with safe and convenient vehicular access, and to avoid the use of land unsuitable for building sites.

##### 04.03.01. Minimum Lot Dimensions

Minimum lot sizes as to depth, width and areas, in any particular district, shall not be less than those sizes required by the Town of Durham, Connecticut, Zoning Regulations for the district in which the subdivision is located. Wherever possible, lot lines shall be perpendicular to straight street lines or radial to curving street lines. Where the front line is an arc, or the side lines converge toward the front lines, the width shall be measured along the minimum front yard setback line parallel to the front line, and if it is an arc, then along the arc of a circle drawn at the minimum front yard.

##### 04.03.02. Lot Numbers

All lots shall be numbered beginning with the numeral "1" and shall continue consecutively throughout the entire subdivision with no omissions or duplications. No fractions or letters shall be used, even in the case of resubdivisions.

Adjoining sections of a subdivision having the same title shall not duplicate numbers but shall continue the sequence of numbers used previously for the adjoining land. All lot numbers shall be conspicuous and noted on the map in the approximate center of the lots.

#### 04.03.03. Energy Efficiency and Solar Access

The applicant shall demonstrate to the Commission that he has considered, in developing the plan, the use of passive solar energy techniques. Passive solar energy techniques mean site design techniques which maximize solar heat gain, minimize heat loss and provide thermal storage within a building during the heating season, while minimizing heat gain and providing for natural ventilation during the cooling season. The site design techniques shall include, but not be limited to: (1) house orientations; (2) street and lot layout; (3) vegetation; (4) natural and man-made topographical features; and (5) protection of solar access within the development.

#### 04.03.04. Street Access

All lots shall have frontage on (1) State highways; (2) roads maintained by the Town of Durham; (3) roads which are to be built as part of a subdivision in accordance with these regulations; and (4) unimproved public roads, public highways or public ways over which the developer has a right of access under Connecticut law.

#### 04.04. RELATIONSHIP TO EXISTING STREETS

Proposed subdivisions and any proposed streets therein shall be planned to coordinate with existing streets as follows:

##### 04.04.01. Abutting Streets

Proposed subdivisions abutting an existing Town road or State highway right-of-way shall provide for proper widening of the right-of-way of such road or highway to the width appropriate for the classification given such road or highway by the Commission. Provisions shall also be made for improvements in the travel way as to width, grade and alignment (vertical and horizontal), base, drainage and pavement as may be necessary for the creation of the subdivision.

##### 04.04.02. Access

Any proposed street in a subdivision shall connect to an existing Town road or State highway or to another street in the proposed subdivision or to a street in another subdivision approved by the Commission where the applicant has access rights.

#### 04.04.03. Suitability of Access

The existing street to which the proposed subdivision street connects shall be of sufficient width and have a suitable travel way, grade, alignment and line of sight to provide adequate access for fire protection, other emergency, utility and highway maintenance services to the subdivision and shall be sufficient to accept the traffic to be generated by the proposed subdivision street without undue hazards to vehicles or pedestrians.

#### 04.05. CONSTRUCTION OF NEW ROADS

When a new street is proposed within a subdivision, the following information shall be supplied:

- 1) Plan-Profile drawings prepared on 24" x 36" plan-profile sheets to a scale of 1" = 40' horizontal and 1" = 4' vertical, showing:
  - a) The location and dimensions of existing and proposed street rights-of-way, edges of pavement, curbs, sidewalks, piping, catch basins, manholes, endwalls, bridges, utilities and utility easements, drainage easements, open channels, monuments, tops and toes of all slopes; all data required for accurate layout of roadway center lines and rights-of-way, including stationing, bearings, tangent lengths, arc lengths, radii and central angles of all curves; the location of property lines intersecting the street right-of-way lines and the names of owners of adjacent properties; cross-sections of each street at intervals of fifty (50) feet for design purposes, showing proposed dimensions and materials for construction and locations of drainage piping;
  - b) Profiles of existing ground surface at the center line and at each right-of-way line;
  - c) Profiles of the proposed center line showing proposed grades, vertical curve data and stations at grade changes, intersections and at intervals of fifty (50) feet;
  - d) Profiles of all existing and proposed drainage facilities, bridges and other proposed improvements

showing locations, sizes, grades and invert elevations.

- 2) A drainage report including a drainage analysis map (basis of design), detailed design computations and an analysis of the effect of proposed road and drainage facility construction as well as land development associated with existing downstream drainage facilities and adjacent properties. The detailed design computations shall show the design criteria, parameters and methods used in selecting the location, configuration, type and size of all proposed drainage facilities. Such computations shall include tabulated summaries of pertinent design computations.
- 3) Detailed drawings of all bridges, box culverts, retaining walls and other special drainage structures;
- 4) Landscaping plans for the landscaping of center islands, turn-arounds, median strips and other areas within the right-of-way lines of the road.

#### 04.05.01. Road Design

The purpose of these standards is to assure that proposed roads shall be in harmony with existing or other proposed roads with regard to smooth traffic flow and safe intersections with such roads. As far as practicable, roads shall follow natural contours.

Where the land to be subdivided abuts a street as defined in Section 02.19.04. of these Regulations, the street shall conform to the standards and specifications set forth herein. Where the land to be subdivided does not abut a street as defined by Section 02.19.04. of these Regulations, the subdivider shall, as the Planning and Zoning Commission may determine, either: (1) provide and construct a road from the subdivision to a town or state road, in accordance with the standards and specifications contained herein; or (2) widen, alter or improve an existing road in accordance with the standards and specifications contained herein.

#### Functional Classification

The basis for determining the applicable standards for any road in the Town of Durham will be the road's functional classification as defined below:

**Collector:** A collector road collects traffic from local access roads and channels traffic to principal arterials such as Routes 17, 68, 77 and 79. It provides for traffic movement between areas of town, arterials and local access roads. A collector customarily receives traffic from more than two (2) local access roads or

provides circulation within commercial or industrial areas. Roads designed to accommodate present or at any future time traffic other than that generated in the area shall be classified as collectors. All roads within commercial or industrial areas will be classified as collectors (examples: Foot Hills Road, Higganum Road, Howd Road, Johnson Lane, Maiden Lane, Parmelee Hill Road, Tri-mountain Road).

**Local Access:** A local access road provides direct access to abutting property and neighborhoods and access to collector roads.

**Local Access (Permanent Dead End):** A local access (permanent dead end) road provides direct access to abutting property, and there is no possibility of extension of the road at a future time.

Design Standards

These standards have been developed based on the concept of providing safe travel at the design speed specified for the functional classification of the road. When no standard exists for a given feature of the roadway, this concept shall prevail, and the roadway feature shall be designed based upon the specified design speed.

The following table is a summary of the criteria to be considered when designing roads in the Town of Durham:

Road Design Standards Table

<u>Design Criteria</u>	<u>Collector</u>	<u>Local Access</u>	<u>Cul-de-Sac</u>
Average Daily Traffic (VPD)	1500-3000	500-1500	less than 500
Design Speed	35 mph	30 mph	25 mph
Minimum Right-of-Way Width	50'	50'	50'
Minimum Pavement Width	30'	24'	24'
Vertical Alignment:			
Minimum Grade	1.0%	1.0%	1.0%
Maximum Grade	8.0%	10.0%	10.0%
Minimum Stopping Sight Distance	250'	200'	200'

Minimum Length of Crest Vertical Curves	50 x A but not less than 3 x (design speed)	30 x A	20 x A
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<u>Design Criteria</u>	<u>Collector</u>	<u>Local Access</u>	<u>Cul-de-Sac</u>
Minimum Length of Sag Vertical Curves	50 x A but not less than 3 x (design speed)	36 x A	30 x A

Horizontal Alignment:

Minimum Radius of Curvature	470'	340'	225'
Minimum Tangent Length Between Curves	100'	50'	50'

NOTE: At illuminated intersections, sag vertical curves may be reduced to a minimum length of 3 x (design speed) provided adequate stopping sight distance is maintained.

\*A = (g1 - g2), g1 and g2 refer to % grade on each side of curve.

Intersections

	<u>Collector</u>	<u>Local Access</u>	<u>Cul-de-Sac</u>
Maximum Intersection Approach Grade	3.0%	3.0%	3.0%
Minimum Intersection Approach Tangent as Measured from Pavement Intersection	50'	20'	20'
Required Angle of Intersection (Degrees)	90	90	90
Minimum Curb Radius	25'	25'	25'
Minimum Centerline Offset where Thru Street is:			
Local Access	n/a	150'	150'
Collector	400'	300'	200'
Minimum Intersection	415'	355'	295'

Sight Distance (Column  
Heading Refers to Road  
Intersected)

or:  $11.75 \times (\text{85th Percentile Speed})$   
Whichever is Greater

NOTE: Where field conditions dictate that to obtain the required sight distance based on the observed 85th percentile speeds would have significant adverse environmental, historical or cultural impact; the maximum attainable intersection sight distance (ISD), as outlined in The Connecticut Department of Transportation Guidelines for Highway Design, January 1990, Table T3-1.03a, "Intersection Sight Distance Criteria", and as determined by the Commission based on existing field conditions, road geometry and historical impact, shall be enforced. This value shall be greater than the minimum tabular ISD value based on design speed.

See Figure 1 for Intersection Sight Distance Details.

Local access roads should be designed to minimize through traffic movements and reduce average traffic speeds. This can be best accomplished by designing offset and "T" type intersections as opposed to four (4) way intersections.

There shall be a maximum of four (4) approaches to an intersection. Intersections shall be spaced so as to minimize potential traffic conflicts, particularly in the case of intersections with routes such as State highways. Intersections shall be spaced a minimum of 200' apart.

#### Storm Drainage Intersections

Where the development streets join existing Town roads, the developer shall provide drainage at the intersections as directed by the Town Engineer.

#### Minimum Pavement Structure (All Depths Compacted)

	<u>Collector/ Industrial</u>	<u>Local Access</u>	<u>Cul-de-Sac</u>
Bituminous Concrete - In No Areas Shall It Be Less Than The Following:			

Binder Course	2"	1.5"	1.5"
Surface Course	2"	1.5"	1.5"
	<u>Collector/ Industrial</u>	<u>Local Access</u>	<u>Cul-de-Sac</u>
Process Base	6"	4"	4"
Gravel Sub-base	10"	8"	8"
Gravel Sub-base in Rock Cuts	18"	12"	12"

In the case of improvements to be made to an existing Town road that is classified as either a local access road or a local access (permanent dead-end) road, the required pavement layers may be reduced as follows:

If the number of residences proposed on the road is between eleven (11) and twenty-five (25), construction of the pavement surface course and the bituminous curb may be deferred, with either the Town or future developers becoming responsible for the costs of constructing the surface course and curbs.

If the number of residences proposed on the road is ten (10) or less, the pavement layers may be omitted and replaced by a 1" layer of compacted stone screenings.

#### Additional Requirements

All roads will be constructed with a cross slope of 1/4" per foot, drained from the centerline of the road toward the curb.

Six (6) inch bituminous concrete curbs will be constructed on both sides of all paved roads.

Roadway side slopes will be designed with a minimum of a 5' shelf behind the curb with a maximum slope of 1"/foot.

Maximum fill and cut slopes will be 2:1 (horizontal:vertical). If fill height exceeds 4', guide railing will be provided, or slopes will be flattened to 4:1. Guide railing shall be placed 4' from the back of the curb.

No zoning permit, other than for a foundation, shall be issued until the first course of the wearing surface has been applied in accordance with the "Specifications for Road and Street

Construction, Town of Durham, Connecticut" as amended.

Figure 2 shows the typical cross section for roads with curbing.

Figure 3 shows the typical cross section for existing Town roads where no curbing is to be constructed.

#### 04.05.02. Cul-de-Sacs or Dead End Road

Cul-de-Sacs or Dead End Road - A road having only one intersection with another road and having a turnaround entirely surrounded on its frontage with separate lots.

A temporary turnaround shall be provided on all temporary cul-de-sacs roads, with a notation on the subdivision map that land outside the normal street right-of-way shall revert to abutters whenever the street is continued.

Permanent dead-end roads may be permitted provided such design will not (1) cause undue concentrations of traffic, (2) will not be prejudicial to the needs of public health and safety by unduly delaying or inhibiting access to lots and (3) the applicant has demonstrated that any proposed dead-end road is the only road layout that is both feasible and prudent.

Any permanent or temporary dead-end road which exceeds 1,200 feet, or provides frontage for 24 lots or dwelling units as measured from the center of the turn-around from the edge of pavement to center of the pavement of the nearest intersecting through street shall provide for adequate fire protection measures and access for emergency services, if acceptable to the Commission. Off-site improvements may be constructed to meet the requirement if acceptable to the Commission and the applicant.

All permanent or temporary dead-end roads shall terminate in a turnaround with a right-of-way of 110 feet in diameter, 90 feet of which shall be paved and in conformance with Figure 4, "Town of Durham, Cul-de-Sac Detail".

An alternative cul-de-sac design, utilizing a center island, may be considered by the Commission provided plans for an 18 foot roadway surrounding the cul-de-sac (minimum), are recommended for approval to the Commission by the Town Engineer. Note: All such designs shall be reviewed by the Town Engineer for suitability on a case by case basis.

#### 04.06. LOT ACCESS

It must be demonstrated that the proposed development or house site on each lot can be accessible from a public or private road via its own driveway in accordance with Section 04.07. (Driveways) utilizing its own frontage.

#### 04.07. DRIVEWAYS

Driveways shall have a minimum curb radius of five (5) feet. All driveways shall have a maximum grade of fifteen (15) percent and shall be constructed of a minimum of eight (8) inches of gravel. All driveways that exceed a ten (10) percent grade shall be surfaced with a minimum of one and one half (1 1/2) inches, compacted depth, of bituminous concrete or oil penetration, recommended for approval to the Commission by the Town Engineer. All driveway aprons within ten (10) feet of the road curb line on paved roads shall be paved.

Whether a driveway has a positive or negative grade, the entrance to the driveway should slope up from the gutter four (4) to six (6) feet or an acceptable alternative such as additional road drains shall be provided, as approved by the Town Engineer, to prevent roadway surface drainage from entering the property.

To allow safe exit from a driveway, adequate sight distance must be provided. The criteria for intersection sight distance as noted in the road design standards also applies to driveways. Wherever possible, these distances should be attained and no less than safe stopping sight distance will be accepted.

#### 04.08. SIDEWALKS

Sidewalks, when required by the Planning and Zoning Commission, shall be four (4) feet wide and shall be constructed on an eight (8) inch gravel base. In commercial zones, places of assembly or any other area that generates a high volume of pedestrian traffic, sidewalks shall be surfaced with five (5) inches of portland cement concrete. In all other areas, sidewalks shall be surfaced with two (2) inches of bituminous concrete or other acceptable alternative as approved by the Commission.

#### 04.09. STREET LIGHTS

Street lights shall be located at a minimum of all road intersections and at the end of cul-de-sacs. Lights shall be installed in accordance with the latest recommendations of the

Illuminating Engineering Society's American National Standard Practice. Standards and luminaries shall be designed to blend with the character and architecture of the area.

#### 04.10. OTHER UTILITIES

All utility systems and facilities (which shall include electric, gas, telephone and cable TV) shall be located underground and constructed so as to minimize the need for later adjustment and to permit servicing with a minimum amount of interference with road traffic. Installations running parallel to the road will be located outside the curb area. Facilities under the pavement will be limited to lateral service connections. If it is anticipated that additional utilities will be required, sleeves shall be provided under the full width of the road prior to the placement of pavement.

#### 04.11. STORM DRAINAGE

##### 04.11.01. General

Roadway drainage shall be sufficient to carry run-off from the road surface and divert water beneath or around the road without causing sedimentation, erosion or impounding of water on property upstream.

Storm drain culvert sizes shall be designed on a storm drainage frequency of ten (10) years or greater. Storm drain culverts will be designed to flow full or less than full using the Manning formula. The minimum storm drain culvert diameter shall be fifteen (15) inches.

Cross culverts shall be designed based on a fifty (50) year frequency storm, with the effects of a one hundred (100) year frequency storm evaluated to insure that no erosion will take place and that the road will not be inundated. The minimum cross culvert pipe diameter will be twenty-four (24) inches.

All open pipe ends shall be treated with either a headwall or a flared end.

Gutter flow analysis shall be performed to demonstrate that the width of gutter flow will not exceed six (6) feet in a ten (10) year frequency storm. In no case shall catch basins be spaced so that flow is unintercepted for a distance greater than three hundred (300) feet.

A minimum of twenty-four (24) inches of cover shall be provided over all storm drain culverts. All changes in direction or grade shall be made in a manhole or catch basin.

The minimum velocity in a pipe shall be 2.5 feet per second. The maximum velocity in a pipe shall be fifteen (15) feet per second. Pipe flows with velocities over ten (10) feet per second shall require drop structures to dissipate the velocity at manholes and catch basins.

The velocity of flow in an open channel shall be restricted to 2.5 feet per second for grass channels and ten (10) feet per second for rip-rap protected channels.

Underdrains shall be required in all areas in which soil test data indicates ground water within three (3) feet of the finished pavement surface in areas adjacent to the road. Underdrains may be recommended by the Town Engineer in other locations as dictated by field conditions. Provisions shall be made for connection of foundation underdrains to roadway underdrains by providing "T" connections.

The overall drainage system shall be designed so that the run-off rate outside of the subdivision during or after development does not exceed the rate that existed prior to development. This may be accomplished by retention basins, infiltration basins or other acceptable means as recommended by the Town Engineer.

When stormwater discharges into areas designated as inland wetlands or watercourses, plans shall be submitted to the Inland Wetlands and Water Courses Agency for comments and approval.

Where the subdivision storm drainage system is proposed to discharge into a Town storm drainage system, the developer shall make provisions to accommodate the anticipated additional discharge in the event that the Town system is not adequate. Necessary improvements to the Town system to accommodate new subdivision stormwater discharges may be required at the expense of the developer.

#### 04.11.02. Easements and Rights to Drain

- 1) Rights to Drain--The developer shall obtain drainage rights, when necessary, for flows across adjacent properties. The rights shall include provisions for the Town to enter and maintain the existing or proposed facilities if the system is to be accepted by the Town.
- 2) Easements--Drainage easements shall be required for any part of the storm drainage system located outside of the street right-of-way (excluding building drains and private drains).

All drainage easements shall conform to the requirements of Section 04.11.01.(7) of these Regulations.

#### 04.11.03. Storm Drainage Design

- 1) Design--All storm drainage systems shall be designed in accordance with the design standards of the Town of Durham, Road Specifications.
- 2) Design Formula--All design formula shall adhere to acceptable engineering practices, and the calculations and their method of derivation shall be shown in the material submitted as part of the final application. Drainage computations showing the following shall be submitted:
  - a) Plans showing the watershed area for the development.
  - b) Calculations showing the area, time of concentration, intensity, coefficient, flow, velocity, pipe size, and slope of each pipe length.
- 3) Design Storm Criteria--All storm drainage facilities shall be designed based on the Standards of the Town of Durham, Road Specifications.

#### 04.11.04. Retention/Detention Systems

Measures for the retention and/or detention and controlled release of stormwater run-off from the subdivision shall:

- 1) Not exceed the rate of run-off for the same site in its undeveloped state for all intensities and durations of rainfall.
- 2) Have the ability to retain and maximize groundwater recharge. The design of the stormwater run-off control system shall give consideration to providing groundwater recharge.
- 3) Require that all on-site facilities be properly maintained by the owner so that they do not become nuisances. All run-off control structures located on private property, whether dedicated to the Town or not, shall be accessible at all times for Town inspection. Where run-off control structures have been accepted by the Town for maintenance, access easements shall be provided.

#### 04.12. EASEMENTS AND RIGHTS-OF-WAY

For purposes of these Regulations a right-of-way is owned in full

by the party having the right to use the land, and an easement is the right of one party to use a designated portion of another party's land for a specific purpose.

#### 04.12.01. Required Easements and Rights-of-Ways

Permanent easements that run with the land and burden the premises in perpetuity, or rights-of-way shall be granted or obtained for access to and use of all land associated with subdivision improvements located outside the street right-of-way. Subdivision improvements that require easements or right-of-ways include, but are not limited to, the following:

- 1) Construction and Maintenance: All bridges, culverts, permanent sediment and erosion control measures, stormwater retention structures, and recreational facilities shall be located within an easement or right-of-way dedicated to the Town to allow for necessary repairs and maintenance. The easement or right-of-way shall be large enough to accommodate the entire structure or facility and appurtenances and to allow reasonable room for appropriate equipment to be maneuvered.
- 2) Access--Bridges, culverts, permanent sediment and erosion control measures, stormwater retention structures, and recreational facilities shall have access easements for construction and maintenance equipment. Access easements shall be a minimum of 30 feet wide and graded and cleared suitably for use by the appropriate equipment.
- 3) Utilities--All utilities and related appurtenances located outside the street right-of-way shall have utility easements for use and access. The easements shall be a minimum of 20 feet wide, substantially centered on the utility, and centered on or parallel to property lines whenever possible.
- 4) Slopes--Slope easements for grading, maintenance and repair of roadway slopes shall be required for substantial cuts or fills located outside the street right-of-way. Slope easements shall also be required adjacent to future road extensions.
- 5) Sight lines--Sight line easements shall be required across corners of lots at intersections to assure safe lines-of-sight for motorists. The size of the easement shall be based upon the required sight distance and the site characteristics, as determined by the Town Engineer, and added to the street right-of-way.

- 6) Pedestrian Walkways--Pedestrian easements or rights-of-way shall be required for walkways to parks, playgrounds, schools, and other public or semi-public places where the road system does not conform to a convenient pattern of pedestrian circulation, and to open space and recreation areas within the subdivision. Pedestrian easements and rights-of-way shall be a minimum of fifteen (15) feet wide and suitably graded and located for pedestrian use.
- 7) Storm Drainage--Drainage easements shall be provided for all parts of the storm drainage system located outside the street right-of-way.
  - a) Where it is necessary to drain a public street across lands included in the subdivision, the plans shall provide an easement for the discharge of water in favor of the Town of Durham. The location of such easements shall be satisfactory to the Commission and the Town Engineer.
  - b) Where it is necessary to obtain an easement to discharge water from a public right-of-way across private lands not included in the subdivision, the developer shall obtain an agreement from the owner(s) of the private land to grant a right to permanently discharge water across said land to the Town of Durham. The developer shall submit copies of said agreements to the Commission at the time of application for final subdivision approval.
  - c) Drainage easements shall be a minimum of 20 feet wide and centered on the pipe. Easements for outlet pipes shall extend to a suitable existing storm drain or an adequate natural watercourse. Where possible, easements shall be centered on property lines.

#### 04.12.02. Survey and Map Requirements

All easements and rights-of-way shall be shown on the Record Subdivision Plan with adequate survey information to accurately locate the easement or right-of-way in the field.

#### 04.13. STREET NAMES AND SIGNS

##### 04.13.01. Street Names

There shall be no duplication of existing street names nor shall there be a phonetic resemblance to the names of existing streets within the Town. Long, difficult or complicated names may be

denied.

#### 04.13.02. Signs

- 1) Street Name Signs--There shall be at least one permanent four-way street sign located on a minimum of one corner of all intersections in the subdivision. Lettering shall be clearly legible and at least three inches high and of a style approved by the Commission. Such signs shall be erected before any new residential structure on either street in the subdivision is occupied.
- 2) Traffic Control Signs--Traffic control signs shall be provided by the developer at locations deemed appropriate by the Commission.