

ARTICLE V Plan Requirements

§ 153-18. Applicability.

The procedure set forth in this article shall be followed by all applicants proposing to subdivide or develop land in Doylestown Township.

§ 153-19. Sketch plan.

In order to save unnecessary work on major subdivisions and land developments, it is suggested that before preparing preliminary plans a sketch plan be submitted by the subdivider or land developer as a basis for discussion with the Township. It is suggested that the sketch plan show the following information:

- A. The name of the subdivision or land development.
 - B. Tax Map parcel number.
 - C. Location map.
 - D. Adjoining property lines and owners, including those across streets.
 - E. Approximate net buildable site area.
 - F. The name and address of the owner/applicant.
 - G. The name and address of the applicant's engineer, surveyor, architect or landscape architect preparing the plan.
 - H. The tract boundary and location from a survey plan or deed plotting, including a notation as to which is applicable.
 - I. A north point and approximate scale.
 - J. Streets on and adjacent to the tract.
 - K. Significant topographic and physical features, including but not limited to floodplains, steep slopes, woodlands, streams and watercourses, existing structures and driveways, on or within 500 feet of the site and existing land use(s). The Planning Commission may request a greater distance where deemed necessary.
 - L. Contours (replotting and interpolation of United States Geological Survey is sufficient).
 - M. Proposed street, lot and open space layout.
 - N. Approximate tract area and present zoning.
 - O. General arrangement of proposed buildings and parking areas in land developments.
 - P. Any requested rezoning or variances required.
 - Q. The proposed method of wastewater disposal (on-site systems; public sewers).
- C. Existing features.
- (1) Complete outline survey of the property to be subdivided or developed shall be provided, showing all courses, distances and area and tie-ins to all adjacent intersections. The survey shall not have an error of closure greater than one part in 10,000.
 - (2) Total acreage of the land to be developed or divided.
 - (3) The location, name and widths of all streets bordering the land to be developed or subdivided, including legislative and traffic route numbers and their existing and ultimate right-of-way.
 - (4) The location of all existing buildings and their existing and proposed use or disposition.
 - (5) Location of all existing monuments, iron pipes or pins and spikes relative to the property.
 - (6) The location of any designated floodplain district, the one-hundred-year flood elevations and the boundaries of the floodplain districts, including those determined by soil classification or other studies.
 - (7) Contours at vertical intervals of two feet. Slopes of 15% to 25% and slopes of greater than 25% shall be mapped and shown on the plans. The total area of land within these slope characteristics shall be calculated and shown in table form on the plans. The area to be disturbed under the proposed plan application within each slope classification shall be shown and the area of proposed disturbance shall be shown and compared with the Zoning Ordinance Editor's Note: See Ch. 175, Zoning. requirements on slope restrictions.

- (8) Datum to which contour elevations refer. Vertical datum shall be National Geodetic Vertical Datum (NGVD). The plans shall include the elevation, location and description of an NGVD bench mark for the site.
- (9) Location, size and ownership of all underground utilities.
- (10) The location of watercourses, wells, on-site septic systems, stormwater management facilities and similar features on and within 400 feet of any part of the land to be subdivided or developed.
- (11) Species and size of large trees standing alone, mature trees with a diameter of 12 inches or greater as measured 14 inches above grade level, woodlands as defined herein, landfill areas, quarries, marshy areas, springs and areas subject to inundation.
- (12) The soil classifications and boundary lines of all soils located on the tract, with specific reference to any alluvial soils boundary. Soil descriptions for all soil types shall be provided and any building restrictions due to wet soils, seasonally high water table or other restrictions shall be provided on the plans.
- (13) Lakes, ponds and wetlands. All lakes, ponds and wetlands shall be shown. Wetland soils in Bucks County are: Bowmansville, Doylestown, Hatboro, Fallsington, Towhee and Towhee Stony, and should be considered indicators of possible wetland areas.
- (14) Site capacity calculations as established in Article V of Chapter 175, Zoning. The following information and calculations shall be shown on the plans:
 - (a) Calculation of base site area.
 - (b) Calculation of net buildable site area.
 - (c) Area in acres affected by natural resources, including floodplains, wetlands, slopes of 15% to 25%, slopes over 25% and woodlands.
 - (d) Open space required for resource protection and/or open space preservation, as required by Chapter 175, Zoning.
 - (e) Amount of open space proposed by the plan.
 - (f) Number of dwelling units permitted according to site capacity calculations, and number of dwelling units proposed.
 - (g) Area of impervious surface proposed by the plan and impervious surface permitted by this chapter.

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J. Planting. Existing trees, shrubs and plants shall be retained wherever feasible in the land development, and additional trees and new plant material shall be added for privacy, shade and appearance.

§ 153-34. Landscape regulations.

A. Intent. The intent of this section is to provide for landscaping requirements for subdivisions and land developments in order to maintain the Township's natural vegetation, to provide for harmonious development of contiguous properties and to retard environmental pollution.

B. Required locations. The following landscape requirements shall be the minimum provided in any subdivision or land development:

(1) Overall landscaping. Land used for development shall devote a minimum of 10% of the total developed area to the landscape requirements. This means that of the total net buildable site area, 10% of the area must be devoted to planted buffer yards, street trees, landscaping on individual lots and/or planted landscape islands. For all residential developments there shall be a minimum of 35 caliper-inches of deciduous trees per acre of net buildable area in addition to the requirement for street trees. This requirement can be met with existing trees preserved on the property or with new trees to be planted as part of the site improvement or reforestation process. [Amended 6-1-1993 by Ord. No. 226]

(2) Buffer yards. Buffer yards shall be provided in accordance with the requirements of Chapter 175, Zoning, and shall meet the following requirements:

(a) Existing vegetation should be maintained in buffer and yard areas and may be used to meet or partially meet buffer requirements.

(b) All buffer yards shall be planted with ground cover and trees and shrubs and shall be maintained and

kept clean of debris, rubbish and weeds.

(c) No structure, manufacturing or processing activity, vehicle parking or storage of materials shall be permitted in required buffer areas.

(d) Buffers shall be planted in accordance with the provisions of Chapter 175, Zoning.

(e) It is recommended that a landscape architect licensed in the Commonwealth of Pennsylvania be constituted to ensure the proper use and arrangement of plant material.

(f) Buffer yards shall include along their entire length a mix of shrubs, evergreens and shade/flowering trees so as to provide a complete visual screen.

(g) Recommended landscape and buffer plants include the following: [Added 1-18-2000 by Ord. No. 281]

[1] Deciduous shade trees.

Acer ginnala - Amur Maple

Acer saccharum - sugar maple

Fagus grandifolia - American beech

Fagus sylvatica - European beech

Betula nigra - river birch

Fraxinus americana - white ash (seedless cultivars only)

Fraxinus pennsylvanica lanceolata - green ash (seedless cultivars only)

Gleditsia triacanthos inermis - thornless honey locust

Liquidambar styraciflua - sweetgum

Liriodendron tulipifera - tulip poplar

Nyssa sylvatica - black gum tupelo

Platanus acerifolia - London planetree

Quercus alba - white oak

Quercus borealis - northern red oak

Quercus coccinea - scarlet oak

Quercus palustris - pin oak

Quercus phellos - willow oak

Tilia - linden (all species hardy to the area)

[2] Flowering trees.

Cornus florida - flowering dogwood

Cornus mas - cornelian cherry

Cornus stolonifera - red-osier dogwood

Crataegus viridis "Winter King" - Winter King Hawthorne

Magnolia species

Malus species - crabapple (disease resistant varieties only)

Pyrus calleryana cv Redspire - Redspire callery pear

[3] Evergreen trees.

Ilex opaca - American holly

Picea abies - Norway spruce

Picea omorika - Serbian spruce

Pinus strobus - Eastern white pine

Pseudotsuga menziesii - Douglas fir

Tsuga canadensis - Canadian hemlock

[4] Deciduous shrubs.

Clethra alnifolia - summersweet
Euonymus alatus - burning bush
Hamamelis x intermedia - witch hazel
Myrica pennsylvanica - bayberry
Viburnum carlesii - Koreanspice viburnum
Viburnum dentatum - arrowwood viburnum
Viburnum dilatatum - linden viburnum
Viburnum plicatum tomentosum - doublefile viburnum

[5] Evergreen shrubs.

Ilex glabra - inkberry
Ilex verticillata - winterberry
Rhododendron species - rhododendron and azaleas (hardy varieties only)
Syringa vulgaris - lilac
Taxus species - yew
Thuja occidentalis nigra - dark American arborvitae
Viburnum rhytidophyllum - leatherleaf viburnum

(3) Street trees. Within any land development or subdivision, street trees shall be planted along all streets where suitable street trees do not exist. [Amended 10-1-1996 by Ord. No. 253; 1-18-2000 by Ord. No. 281]

(a) Large trees shall be planted at intervals of not more than 40 feet. An equivalent number of trees may be planted in an informal arrangement, subject to Township approval. Flowering trees shall be planted at intervals of not more than 30 feet.

(b) Street trees shall not be planted opposite each other but shall be staggered. Trees shall be planted outside the right-of-way and within five feet of the right-of-way line.

(c) At intersections, street trees shall be located no closer than 60 feet to the intersection of the street right-of-way.

(d) Street trees shall be of nursery stock. They shall be of symmetrical growth, free of insects, pest and disease and suitable for street use and durable under the maintenance contemplated.

(e) The minimum trunk diameter, measured at six inches above the finished grade, shall be 2.5 inches.

(f) The developer shall provide for the replacement of plantings that do not survive an eighteen-month period after dedication of the public improvements. In the absence thereof, the developer shall provide for the replacement of plantings that do not survive a two-year period.

(g) Recommended street trees include the following. Other species may be substituted upon approval by the Township. Native species are preferred. [Amended 1-18-2000 by Ord. No. 281]

[1] Large trees.

Acer ginnala - Amur maple
Acer saccharum - sugar maple
Fraxinus americana - white ash (seedless cultivars only)
Fraxinus pennsylvanica lanceolata - green ash (seedless cultivars only)
Gleditsia triacanthos inermis - thornless honey locust
Liquidambar styraciflua - sweetgum
Nyssa sylvatica - black gum tupelo
Platanus acerifolia - London planetree
Quercus alba - white oak
Quercus borealis - northern red oak

Quercus coccinea - scarlet oak
Tilia - linden (all species hardy to the area)

[2] Flowering trees.

Cornus florida - flowering dogwood
Crataegus viridis "Winter King" - Winter King Hawthorne
Magnolia species
Malus species - crabapple (disease resistant varieties only)

(4) Selection criteria. In selecting plants, the following criteria should be followed: [Amended 1-18-2000 by Ord. No. 281]

- (a) Species longevity.
- (b) Native to the area.
- (c) Maintaining the diversity of species in the area.
- (d) Hardiness (wind firmness, climate requirements, characteristics of soil to hold tree).
- (e) Susceptibility of insect and disease attack and to pollution.
- (f) Aesthetic values (autumn coloration, type of flowers or fruit, form characteristics).
- (g) Maintenance and care (pruning, etc.).
- (h) Wildlife values.
- (i) Comfort to surroundings (summer shade).
- (j) Protection of buildings, vehicles and pedestrians.
- (k) Size at maturity.
- (l) Effect of soil retention and erosion control.
- (m) Value as a noise buffer.
- (n) Ability of mix of proposed plantings to create a complete visual screen.

(5) Landscape requirements for stormwater detention facilities. Landscaping and planting in detention basins shall be provided which will not have a negative effect on the hydrological function of the basin, which are aesthetically pleasing and compatible with surrounding land uses and which require a minimum of maintenance. The guidelines which follow are contained in the following report: "A Landscape Strategy for Detention Basins," prepared by the Morris Arboretum of the University of Pennsylvania, September 1980. They shall be used in preparing planting plans for detention basin areas.

- (a) Basin floors. A meadow of native and naturalized wildflowers and grasses shall be provided for. This shall be planted through hydroseeding, which shall contain seed, water and fertilizer. A mix of the following plants is recommended: swamp milkweed, New England aster, wild hyacinth, bottle gentian, cardinal flower, great blue lobelia, switch grass and mountain mint.
- (b) Wet edges. In areas that remain wet all or most of the time, a mixture of woody and herbaceous swamp species shall be planted, such as cattails, reed canary grass, bullrushes, swamp rose mallow, purple loosestrife, swamp smartweed, or woody species such as bald cypress, black gum, sweet gum, shadbush, river birch, red osier dogwood and winterberry holly.
- (c) Wooded areas. Where detention basins adjoin wooded areas, trees and shrubs should be planted which blend with the surroundings. Plantings shall be of sufficient density to eliminate the need for mowing.

[1] Plants to be located within the basins should be tolerant of wet soils and include the following species:

- [a] Trees. Red or swamp maple, downy shadblow or serviceberry, American born-beam, American holly, incense cedar, sweet gum, sweet bay magnolia, southern bayberry, American plane tree, swamp white oak, bald cypress, dark American arborvitae, American linden, river birch.
- [b] Shrubs. Bottlebrush buckeye, red chokeberry, Carolina allspice, white fringe tree, sweet fern, red osier dogwood, inkberry holly, winterberry holly, spicebush, goat willow, pussy willow, withe rod, arrowroot, hanny-berry, European cranberry bush, American cranberry bush.

[2] Trees and shrubs planted on rims or banks shall be tolerant of dry soil conditions and shall be of the

following types: hackberry, Marshall's seedless ash, thornless honey locust, eastern red cedar, scarlet oak, bur oak, black locust, sassafras, black tupelo, London plane tree, Douglas fir, red oak, dark American arborvitae, sweet fern, gray dogwood, Warminster broom, southern bush honeysuckle, Russian olive, autumn olive, common witchhazel, northern bayberry, fragrant sumac, shining sumac, smooth sumac, staghorn sumac, rose acacia, shining rose, goat willow, hannyberry.

(d) Slopes. On slopes of less than 15%, a mixture of meadow grasses and wildflowers is recommended. On slopes of 15% or greater, a herbaceous ground cover such as crown vetch, bird's-foot trefoil, tiger lilies or dense spreading shrubs is required. If crown vetch or bird's-foot trefoil is seeded, a nurse crop such as perennial rye shall be planted to provide cover while the permanent plants become established. Suitable shrub plantings are: sweet fern, Warminster broom, southern bush honeysuckle, northern bayberry, fragrant sumac, shining sumac, rose acacia, shining rose, rugosa rose, hannyberry.

(e) General. Deciduous trees and shrubs should be planted during the spring or fall. Evergreens should be moved in late summer or early fall. Trees of one to 1.5 inch caliper are required. Shrubs should be two to three feet in height. Balled and burlapped nursery stock is required. The plantings shall be maintained permanently, and any plant material which does not live shall be replaced within six months. A performance bond shall be posted with the Township in an amount equal to the estimated cost of trees and plantings, to be released only after the passage of the third growing season following planting.

(6) Requirements for landscape conservation plan. [Added 6-1-1993 by Ord. No. 226]

(a) General. The purpose of the landscape conservation plan is to identify the natural characteristics of the property to be developed and to demonstrate to the Township that adequate care has been taken to protect trees and woodlands on the site. The Township standards are designed to avoid tree removal where possible, to minimize disturbance of the landscape where removal is necessary and to require the replacement of trees where a major disturbance is necessary.

(b) Preservation requirements. The plan shall show that the preservation requirements, as set forth in § 153-34C, Woodlands and tree preservation requirements, of this chapter are met. The plan shall indicate areas of existing woodlands, trees on the property by size category (six inches to 12 inches, 13 inches to 24 inches, 25 inches to 48 inches, and greater than 48 inches), trees to be preserved, trees to be removed, areas of woodlands to be preserved and areas of woodland to be removed, and a table indicating the caliper-inches of trees to be preserved and removed by tree size category. The table shall demonstrate that the preservation requirements of the Doylestown Township Code have been met.

(c) Reforestation. If an applicant is proposing to reforest part of the property in accordance with the provisions of § 153-34C, then the landscape conservation plan shall show the number, species, size and proposed locations for all replacement trees.

C. Woodlands and tree preservation requirements. [Added 6-1-1993 by Ord. No. 226]

(1) Ninety percent of the total area of woodlands in floodplains, wetlands and on slopes over 25% shall be preserved. This preservation requirement is based upon area covered by woodlands, not on the number of individual trees within these areas; the requirement is to preserve 90% of the land area covered by woodlands. This requirement shall be distinct and separate from other requirements which apply to all parts of the site not affected by floodplains, wetlands, steep slopes of greater than 25% or the area within the ultimate right-of-way.

(2) On all parts of the site which are not located in floodplains, wetlands, on steep slopes (in excess of 25%) or within the ultimate right-of-way of existing roads, all trees (including those which are within woodlands or outside woodlands, as defined herein) shall be protected in accordance with the following requirements:

Tree Size (inches)	Amount of Preservation Required*
6 to 12	60%; 40% if replacement trees are provided
13 to 24	70%; 50% if replacement trees are provided
25 to 48	90%
Over 48	100%

*Total caliper (diameter) inches is determined for all trees of each size; the preservation percentage requirement is multiplied by the total caliper-inches to determine how many caliper-inches should be preserved.

(3) Trees which are diseased and which should be removed for safety or for the protection of other healthy trees, as certified by a trained arborist, may be removed and will not be subject to the requirements for tree preservation or tree replacement if the report of the arborist is submitted to and approved by the Township.

(4) Tree removal necessary to accommodate public utilities or public facilities to be constructed or installed by the Township or the Township Authority shall be exempt from the woodland and tree preservation standards.

(5) Reforestation procedures.

(a) Up to 60% of the total caliper-inches of trees between six inches and 12 inches and up to 50% of the total caliper-inches of trees between 13 inches and 24 inches on a lot may be removed only under the conditions set forth in Subsection C(5)(b). Under no circumstances shall an owner or developer be permitted to remove more than 60% of the total caliper-inches of trees sized six inches to 12 inches, or more than 50% of the caliper-inches of trees sized 13 inches to 24 inches.

(b) In the event that an applicant removes between 40% and 60% of the caliper-inches of those trees of six inches to 12 inches in caliper, or between 30% and 50% of the caliper-inches of those trees of 13 inches to 24 inches in caliper, then the applicant shall be required to reforest the lot in accordance with the following formula:

[1] The total number of caliper-inches removed in excess of the amount permitted to be removed by right without reforestation shall be determined.

[2] The resulting figure shall be multiplied by 0.60 to determine the total number of caliper-inches of trees to be replaced on the lot.

[3] The amount of caliper-inches determined in Subsection C(5)(b)[2] above shall then be divided by three to determine the total gross number of trees to be planted on the lot for reforestation.

[4] Replacement trees shall meet the following specifications:

[a] Trees shall meet the following minimum size requirements:

[i] Deciduous trees shall be a minimum of three inches to 3 1/2 inches in caliper (meeting the American Association of Nurserymen Specifications).

[ii] Coniferous trees shall be a minimum of eight feet to 10 feet in height.

[iii] Two flowering trees may be substituted for one deciduous tree or one evergreen tree, provided that the minimum size of the flowering trees shall be 2 1/2 inches to three inches in caliper.

[b] The types of trees to be planted shall be selected on the basis of the tree list and guidelines found in this chapter.

[c] Up to 25% of the new trees to be planted may be of the coniferous variety.

[d] Where 25 or more trees need to be planted to meet the reforestation requirements, a minimum of three tree species shall be planted.

[5] Trees required to be planted under these reforestation procedures shall be in addition to any street trees or buffer requirements which this or any other applicable ordinance shall require.

D. When new trees are dug in the nursery for transplanting, many of the tree roots are left in the soil. A newly planted tree needs all the leaves it has available to it to help produce food to support the growth of new roots. Pruning trees before planting adversely affects the food-producing capability of the tree, which hurts the trees' ability to become established. Only prune broken, poorly shaped or damaged branches from the tree to be planted. [Added 1-18-2000 by Ord. No. 281]

§ 153-35. Tree protection standards.

A. Protection from mechanical injury. Prior to construction the tree protection area shall be delineated by the following methods:

(1) The tree protection area that is delineated on the site prior to construction shall conform to the approved development plans.

(2) All trees scheduled to remain shall be marked; where groups of trees exist, only the trees on the edge need to be marked.

- (3) A forty-eight-inch-high snow fence or other suitable fence, mounted on steel posts located eight feet on center, shall be placed along the boundary of the tree protection area.
- (4) When the fencing has been installed, it shall be inspected and approved by the Township prior to commencing clearing and further construction. The fencing along the tree protection area shall be maintained until all work and construction has been completed. Any damages to the protective fencing shall be replaced and repaired before further construction shall begin.
- (5) Trees being removed shall not be felled, pushed or pulled into a tree protection area or into trees that are to be retained.
- (6) Grade changes and excavations shall not encroach upon the tree protection area.
- (7) No toxic materials shall be stored within 100 feet of a tree protection area, including petroleum based and/or derived products.
- (8) The area within the tree protection area shall not be built upon nor shall any materials be stored there either temporarily or permanently. Vehicles and equipment shall not be parked in the tree protection area.
- (9) When tree stumps are located within 10 feet of the tree protection area, the stumps shall be removed by means of a stump grinder to minimize the effect on surrounding root systems.
- (10) Tree roots which must be severed shall be cut by a backhoe or similar equipment aligned radially to the tree. This method reduces the lateral movement of the roots during excavation, which if done by other methods could damage the intertwined roots of adjacent trees.
- (11) Within four hours of any severance of roots, all tree roots that have been exposed and/or damaged shall be trimmed cleanly and covered temporarily with moist peat moss, burlap or other biodegradable material to keep them from drying out until permanent cover can be installed.
- (12) Sediment, retention and detention basins shall not discharge into the tree protection area.
- (13) Sediment, retention and detention basins shall not be located within the tree protection area.
- (14) Trees shall not be used for roping, cables, signs or fencing. Nails and spikes shall not be driven into trees.

B. Protection from grade change.

- (1) When the original grade cannot be retained at the tree protection area line, a retaining wall shall be constructed outside the tree protection area.
- (2) The retaining wall shall be designed to comply with the municipal standards for retaining walls.
- (3) To ensure the survival of trees, the following methods shall be used:
 - (a) The top of the wall shall be four inches above the finished grade level.
 - (b) The wall shall be constructed of large stones, brick, building tile, concrete blocks or treated wood beams not less than six by six inches. A means for drainage through the wall shall be provided so water will not accumulate on either side of the wall. Weep holes shall be required within any wall.
 - (c) Any severed roots as a result of excavation shall be trimmed so that their edges are smooth and are cut back to a lateral root if exposed.

C. Trees damaged during construction.

- (1) Tree trunks and exposed roots damaged during construction shall be protected from further damage. Damaged branches shall be pruned according to National Arborist Association standards. All cuts shall be made sufficiently close to the trunk or parent limb but without cutting into the branch collar or leaving a protruding stub. All necessary pruning cuts must be made to prevent bark from being torn from the tree and to facilitate rapid healing.

- (2) All trees which have been disturbed or have experienced damage to their roots or branches shall be fertilized. Trees shall be fertilized in early fall or midspring. Fertilizer grade shall have approximately three parts nitrogen to one part phosphorus and potassium (ratio of 3:1:1). Fertilizer shall be broadcast over the soil surface in an area twice the size of the tree protection area at a rate of one pound of nitrogen per 1,000 square feet.

D. Protection from excavations. When there is no alternative but to locate an electrical or other small utility line within a tree protection area, the Township shall determine the most desirable location for the line and the following guidelines shall be used:

- (1) Where possible, trenches should bypass the root area.

- (2) Where trenches must be dug past the side of a tree, the following precautions shall be observed:
 - (a) Trenches shall be no closer to the trunk than half the distance from the drip line.
 - (b) Cut as few roots as possible.
 - (c) If roots have to be cut, cut them as cleanly as possible.
 - (d) Backfill the trench as soon as possible, avoiding soil compaction

§ 153-36. Lighting.

A. Lighting requirements.

(1) Lighting shall be required for all commercial, office and industrial land developments, for all multi-family and townhouse residential areas and, at the discretion of the Board of Supervisors, for all or portions of single-family residential subdivisions. Where required above, the owner shall install or cause to be installed, at the owner's expense, streetlights serviced by underground conduits in accordance with a plan approved by the Philadelphia Electric Company and the Board of Supervisors.

(2) The owner shall be responsible for all costs involved in lighting the streets until such time as the streets are accepted as public streets of the Township. Provision shall be made for energizing said lighting after 50% or more of the dwellings or buildings in a given subdivision or land development or section of a subdivision or land development have been occupied.

B. Streetlights.

(1) Proposed intersections with any collector street or arterial street shall have streetlights.

(2) Where all lots abutting a street have a lot width at the street line of 150 feet or more, streetlights shall not be required except at intersections and shall be placed in accordance with the recommendations of the Township Engineer.

(3) Streetlights shall be installed:

(a) At all street intersections.

(b) At all other spots determined to be hazardous by the Board of Supervisors on the advice of the Township Engineer.

(c) At a maximum spacing of 200 feet.

C. Lighting standards.

(1) Glare.

(a) The lighting plan in and around the parking areas shall provide for nonglare lights focused downward. The incident light intensity provided at ground level shall be a minimum of 0.3 footcandle anywhere in the area to be illuminated. Lighting shall be provided by fixtures with a mounting height not more than 25 feet or the height of the building.

(b) Any other outdoor lighting, such as building and sidewalk illumination, driveways with no adjacent parking and ornamental lighting, shall be shown on the lighting plan in sufficient detail to allow determination of the effects to adjacent properties, traffic safety and overhead sky glow. The objective of these specifications is to minimize undesirable off-premises effects. No use shall produce glare off the premises by illumination originating on the premises. No bare or direct light source shall be visible beyond the lot lines. Only diffused or reflected lights shall be visible beyond the lot line. Illumination from light originating on the site shall not exceed 0.5 footcandle at the lot line. No light shall shine directly into windows or onto streets and driveways in such manner as to interfere with or distract driver's vision.

(c) No sodium vapor lights shall be used.

(2) Footcandle requirements. Horizontal footcandle requirements for development areas shall be as follows:

Type of Development	Minimum Average Footcandle Level
Shopping centers and other commercial areas	2.0
Industrial and office developments	1.0

Recreational areas	1.0
Multifamily, townhouse residential areas	0.6 - 0.8
Residential streets	0.4
Sidewalks	0.2
Pedestrian walkways	0.4

(3) Lighting plan. A lighting plan prepared by a design engineer and approved by the Township and Philadelphia Electric Company (PECO) shall be submitted as part of the final plans. If the construction of the subdivision or land development is to take place in more than one phase, an energizing plan indicating the phasing of streetlighting shall be submitted as part of the final plans. Details of all lighting fixtures and poles shall be submitted with final plans. The preliminary plan shall contain preliminary location of the poles.

(4) Lighting details.

(a) The spacing of light poles along streets shall be indicated.

(b) Photogrammetric detail indicating coverage area of proposed luminaire shall be indicated.

(c) All lighting and accessory equipment shall be standard equipment provided by PECO or variations approved by PECO and the Board of Supervisors.

(d) Type of pole, foundation, luminaire, etc., shall be noted.

§ 153-37. Open space and recreational facilities.

A. General. The standards and requirements for open space preservation, ownership and maintenance outlined in this section shall be considered when reviewing all subdivisions and land developments.

B. Open space requirements. Ownership of any open space required by the provisions of Chapter 175, Zoning, shall be designated.

C. Recreation land/fee requirements. [Amended 12-21-1993 by Ord. No. 231]

(1) Purpose. All residential subdivision or land development plans shall provide for suitable and adequate recreation land and/or fees as set forth in this chapter in order to:

(a) Ensure adequate recreational areas and facilities to serve the future residents of the Township.

(b) Maintain compliance with recreation standards as recommended by the Doylestown Township Park and Recreation Comprehensive Plan as adopted by the Doylestown Township Board of Supervisors.

(c) Minimize overuse of and excessive demand for existing recreational areas and facilities by future residents.

(d) Allow for orderly acquisition and development of recreational areas to serve new residents.

(e) Ensure that dedicated recreation land is suitable for the intended use.

(2) Recreation land dedication requirements.

(a) All residential subdivision or land development plan submissions to the Township shall be required to provide for public dedication of land suitable for park and/or recreation use in accordance with the provisions of this chapter.

(b) A minimum of 2,075 square feet of suitable recreation land shall be provided per dwelling unit within all residential subdivision or land developments, unless the applicant agrees to a fee in lieu as set forth in Subsection C(4) of this section. This requirement is based on the goal of providing 16 acres of recreation land per 1,000 population in accordance with the standards of the National Park and Recreation Association as reflected by the Township Comprehensive Park and Recreation Plan and an average household of 2.988 persons as determined by the United States census in 1990.

(c) This recreation land requirement shall in no way diminish the requirement for open space where an open space requirement is set by Chapter 175, Zoning.

(3) Criteria for determining the location and suitability of recreation areas.

(a) Site(s) shall be easily and safely accessible, have good ingress and egress and have access to a public road.

(b) Site(s) shall have suitable topography for the development as a particular type of recreation area.

(c) Size and shape of the site(s) shall be suitable for the development as a recreation area.

- (d) Site(s) shall meet the minimum size with respect to usable acreage as recommended by the Park and Recreation Plan of Doylestown Township.
- (e) Site(s) designated for recreation land shall not contain lands with natural resources restrictions, as defined by Chapter 175, Zoning, stormwater detention facilities or lands designated for any other purpose.
- (f) The recreational activities and/or facilities for which the area is intended must be specified on the development plans and recorded on the liens.
- (g) Recreation areas shall not be traversed by utility easements unless said utilities are placed underground and no part of them or their supportive equipment protrudes above ground level.
- (h) The configuration of the recreation area must be able to accommodate recreation activities proposed by the development plans. The required area shall not include narrow or irregular pieces which are remnants from lotting and/or street and parking areas.
- (i) On-site improvements shall be commensurate with the adjacent on-site development improvements, including but not limited to grading, curbing and utilities.
- (4) Ownership/dedication to Township of recreation land.
- (a) The Doylestown Township Planning Commission and Park and Recreation Board shall provide recommendations to the Board of Supervisors concerning any proposed recreation land dedication and any proposed assessment of recreation fees in lieu of land dedication.
- (b) If the Board of Supervisors determines that a recreation land dedication would be in the public interest, such recreation land shall be owned and maintained by an entity that the Board of Supervisors determines is acceptable to ensure proper long-term oversight and maintenance of the land. This may be any of, but not limited to, any of the following entities, subject to the approval of the Board of Supervisors, if said entity has agreed to accept such land and is willing to be considered as permanent owner of the recreation space:
- [1] Retention by the owner of the development if such dwelling units are to be rented.
- [2] Dedication to a formal homeowner or condominium association, which such agreement shall be subject to the approval of the Board of Supervisors after review by the Township Solicitor. If any entity responsible for such recreation land should dissolve or become inactive or decide that it no longer wishes to be responsible for such land, it shall offer such land at no cost to the Township or to another entity that the Township so designates for continued use as recreation land.
- [3] Dedication to an established state, county or regional organization acceptable to the Board of Supervisors.
- [4] Dedication to Doylestown Township.
- (c) If the Board of Supervisors deems it to be in the public interest to accept dedicated land for recreational purposes, such acceptance shall be by adoption of a resolution by the Board of Supervisors and acceptance of a deed of dedication from the developer.
- (d) Recreation land shall include deed restrictions to permanently restrict its use for recreation and to prohibit the construction of buildings on the land, except buildings for noncommercial recreation or to support the maintenance of the land.
- (5) Fee in lieu of dedication. Where, upon agreement with the applicant or developer, it is determined that the dedication of all or any portion of the land area required for recreational purposes is not feasible under the criteria set forth in this section, the Township shall require the applicant or developer to pay a fee in lieu of dedication of any such land or to construct recreational facilities in lieu of recreation land dedication to the Township as follows:
- (a) The fee shall be equal to the average fair market value of the land otherwise required to be dedicated and, based upon 1992 land values, the fee in lieu is fixed at \$1,880 per dwelling unit. The fee may be amended, from time to time, by the Board of Supervisors by resolution based upon the then fair market value of land.
- (b) Limitations on use of fees.
- [1] Any recreation fees collected under this subsection shall be placed within an interest-bearing recreation fee account which shall function as a capital reserve fund and shall be segregated from other Township funds.
- [2] To ensure that the lands and facilities are accessible to the residents of the development that paid fees toward their costs, the attached Recreation Fee District Map Editor's Note: Said map is on file in the Township

offices. designates two service areas for neighborhood parks and one Township-wide service area for a Township-wide community park. Any such fees collected under this subsection shall only be expended within the same recreation fee district as the subdivision or land development that contributed the fee if the fee is used for neighborhood parks. Fees collected from any district may be expended for the Township-wide Central Park.

[3] All fees and interest within the recreation fee account shall only be used for acquisition of recreation land, development of and capital improvement to public recreational facilities, landscaping of recreation land, engineering, legal, planning, architecture, landscape architecture and the payment of debt directly resulting from such expenditures. Such fees specifically shall not be used for maintenance, routine repairs, operating expenses or recreational programs.

(c) Fees required under this subsection shall be paid prior to the recording of the applicable final plan or as determined by the Board of Supervisors.

(d) If such fees are paid in installments or prior to the issuance of each building permit, then for the purpose of determining limits for the time within which such funds are required to be expended under state law, such time limit shall not begin until the total fees related to the final approval are paid in full, and not from the date of payment of any portion of such fees. Upon request, the Township shall refund such fee, plus interest accumulated thereon from the date of payment, if the Township has failed to utilize the fee paid for the purposes set forth in this subsection within three years of the effective date of payment.

§ 153-38. Stormwater management and surface runoff control.

A. General. The applicant shall construct and/or install such drainage structures, on site and off site, as necessary to:

- (1) Prevent erosion damage and to satisfactorily carry off or detain and control the rate of release of surface waters.
- (2) Encourage all runoff control measures to percolate the stormwater into the ground to aid in the recharge of groundwater.
- (3) Carry surface water to the nearest adequate street, storm drain, detention basin, natural watercourse or drainage facility.
- (4) Take surface water from the bottom of vertical grades, to lead water away from springs and to avoid excessive use of cross gutters at street intersections and elsewhere.
- (5) Handle the anticipated peak discharge from the property being subdivided or developed and the existing runoff being contributed from all land at a higher elevation in the same watershed.
- (6) Maintain the adequacy of the natural stream channels. Accelerated bank erosion shall be prevented by controlling the rate and velocity of runoff discharge to these watercourses so as to avoid increasing the occurrence of stream bank overflow.
- (7) Preserve the adequacy of existing culverts. Bridges and similar structures shall be preserved by suppressing the new flood peaks created by new land development.

B. Retention of existing watercourses and natural drainage features.

- (1) Whenever a watercourse, stream or intermittent stream is located within a development site, it shall remain open in its natural state and location and shall not be piped.
- (2) The existing points of natural drainage discharge onto adjacent property shall not be altered without the written approval of the affected landowners.
- (3) No stormwater runoff or natural drainage shall be so diverted as to overload existing drainage systems or create flooding or the need for additional drainage structures on private properties or public lands.
- (4) The Board of Supervisors may require the developer to provide a permanent easement along any watercourse located within or along the boundary of any property being subdivided or developed. The purpose of such easement shall be for the maintenance and/or relocation of the channel of any watercourse, The required width of such easement shall be determined by the Township Engineer, United States Army Corps of Engineers, Pennsylvania Department of Environmental Resources or public agency having jurisdiction, but in no case shall such easement be less than 50 feet in width.

C. Design criteria for stormwater management. The Doylestown Township Neshaminy Creek Watershed Stormwater Management Ordinance, a true and correct copy of which is available from the Township, is incorporated into this chapter by reference. In the event the provisions of this chapter (the Doylestown Township Subdivision and Land Development Ordinance) conflict with the provisions of the Doylestown Township Neshaminy Creek Watershed Stormwater Management Ordinance, the stricter provisions shall apply. Editor's Note: See Ch. 148, Stormwater Management. [Amended 2-2-1993 by Ord. No. 220; 4-5-2005 by Ord. No. 321]

- (1) No regulated activities, as outlined in § 148-5 of the Doylestown Township Neshaminy Creek Watershed Stormwater Management Ordinance, shall be approved unless approval has been received for a stormwater management plan which complies with the provisions of this chapter and the Doylestown Township Neshaminy Creek Watershed Stormwater Management Ordinance.
- (2) This section and the provisions of the Doylestown Township Neshaminy Creek Watershed Stormwater Management Ordinance shall apply to all areas of the Township.

D. Design criteria for detention and retention basins.

- (1) (Reserved) Editor's Note: Former Subsection D(1), regarding providing a flow system to carry runoff to a detention basin, was repealed 4-5-2005 by Ord. No. 321.
- (2) Unless permitted as a special exception by the Zoning Hearing Board, detention basins shall not be located within floodplains, nor within areas of floodplain soils, with the exception that areas of alluvial soils may be utilized if proof is accepted by the Board of Supervisors that the area is not subject to flooding.
- (3) Detention basins shall be designed to facilitate regular maintenance, mowing and periodic desilting and

reseeding.

- (4) Whenever possible, the side slopes and basin shape shall conform to the natural topography. When such design is impractical, the construction of the basin shall utilize slopes as flat as possible to blend the structure into the terrain.
- (5) In residential development, shallow broad basins shall be provided.
- (6) The maximum slope of the earthen detention basin embankments shall be four horizontal to one vertical.
- (7) The top or toe of any slope shall be located a minimum of five feet from any property line.
- (8) The minimum top width of the detention basin berm shall be 10 feet.
- (9) (Reserved) Editor's Note: Former Subsection D(9), regarding the required time period for a detention basin to return to normal conditions after a storm, was repealed 2-2-1993 by Ord. No. 220.
- (10) In order to ensure proper drainage on the basin bottom, a minimum grade of 2% shall be maintained for areas of sheet flow. For channel flow, a minimum grade of 1% shall be maintained.
- (11) A collecting swale shall be provided to drain basins.
- (12) If permanent ponds are used, the developer shall demonstrate that such ponds are designed to protect the public health and safety.
- (13) Emergency spillways.
 - (a) Emergency overflow facilities shall be provided for detention facilities to handle runoff in excess of design flows.
 - (b) Whenever possible, the emergency spillway for detention basins shall be constructed on undisturbed ground.
 - (c) Emergency spillways shall be constructed of grass pavers or other material approved by the Township Engineer.
 - (d) All emergency spillways shall be constructed so that the detention basin berm is protected against erosion.
 - (e) The minimum capacity of all emergency spillways shall be the peak flow rate from the one-hundred-year design storm after development.
 - (f) The construction material of the emergency spillways shall extend along the upstream and downstream berm embankment slopes.
 - (g) The upstream edge of the emergency spillway shall be a minimum of three feet below the spillway crest elevation.
 - (h) The downstream slope of the spillway shall, as a minimum, extend to the toe of the berm embankment.
 - (i) The emergency spillway shall not discharge over earthen fill and/or easily eroded material.
 - (j) The minimum freeboard shall be one foot. Freeboard is the difference between the design flow elevations in the emergency spillway and the top of the settled detention basin embankment. [Amended 4-5-2005 by Ord. No. 321]
 - (k) All detention basins shall be landscaped in accordance with the standards set forth in § 153-34B(5), Landscape requirements for detention basins.
- (14) Antiseep collars.
 - (a) Antiseep collars shall be installed around the pipe barrel within the normal saturation zone of the detention basin berms and shall be poured in place.
 - (b) The antiseep collars and their connections to the pipe barrel shall be watertight.
 - (c) The antiseep collars shall extend a minimum of two feet beyond the outside of the principal pipe barrel.
 - (d) The maximum spacing between the collars shall be 14 times the minimum project of the collar measured perpendicular to the pipe.
 - (e) A minimum of two antiseep collars shall be installed on each outlet pipe.
- (15) Outlet pipes.
 - (a) All outlet pipes through the basin berm shall be reinforced concrete pipe with watertight joints.
 - (b) Energy dissipating devices (riprap, end sills, etc.) shall be placed at all basin outlets.
 - (c) Outlet pipes shall discharge to a defined watercourse having a capacity to carry proposed discharge flows.

(16) Perforated risers.

- (a) A perforated riser shall be provided at each outlet of all detention basins during construction for sediment control.
- (b) The riser shall extend to a maximum elevation of two feet below the crest elevation of the emergency spillway.
- (c) The perforated riser shall be designed so that the rate of outflow is controlled by the pipe barrel through the basin berm when the depth of water within the basin exceeds the height of the riser.
- (d) Circular perforations with a maximum diameter of one inch shall be spaced eight inches vertically and 12 inches horizontally.
- (e) The perforations shall be clearly cut and shall not be susceptible to enlargement.
- (f) All metal risers shall be suitably coated to prevent corrosion and wrapped with geotextile fabric to filter sediment.
- (g) A trash rack or similar appurtenances shall be provided to prevent debris from entering the riser.
- (h) All risers shall have a concrete base attached with a watertight connection.
- (i) The base shall be sufficient weight to prevent flotation of the riser.
- (j) An antivortex device, consisting of a thin vertical plate normal to the basin berm, shall be provided on the top of the riser.

D.1. Design criteria for groundwater recharge via best management practices

(1) Designers are referred to the Pennsylvania Handbook of Best Management Practices for Developing Areas, dated Spring 1998, as prepared for the Pennsylvania Association of Conservation District, Inc., and the Pennsylvania Department of Environmental Protection.

(2) Stormwater runoff peak rate determinations will be determined as outlined in § 153-38C. The volume of groundwater recharge on sites shall be maintained at predevelopment levels to assure that there is no reduction of the annual recharge to the groundwater reservoir resulting in a lowering of the base flow of streams and of the water supplied to wells.

(3) The suitability of soils for infiltration shall be determined from the Soil Survey of Bucks County (1975 Edition) and from on-site soil testing. A minimum infiltration of 0.5 inches per hour is required in the soil horizon in which the infiltration device bottom is situated.

(4) Best management practices shall be selected with primary emphasis on infiltration through upper soil horizons, through wooded grounds, grassy areas and infiltration berms, with secondary emphasis on below ground infiltration devices.

(5) Design criteria for infiltration systems.

(a) Soil infiltration tests shall be made to a depth of not less than three feet below the bottom of the infiltration beds established by the Bucks County Department of Health. All infiltration methods shall be designed to handle the ten-year storm. Seventy-five percent of the tested percolation rate shall be used to determine the storage volume required.

(b) All infiltration systems shall be sized to store the net increase in stormwater volume resulting from site disturbance, using the two-year frequency rainfall (3.3 inches in 24 hours) without consideration of infiltration during precipitation.

(c) All infiltration systems shall mitigate the peak rate of runoff from the site to the predisturbance con-

dition, using the one-hundred-year frequency rainfall (7.2 inches in 24 hours) with consideration of the estimated soil infiltration during precipitation.

(d) All roof drains shall discharge into infiltration systems, with appropriate measures to prevent vegetative clogging.

(e) Where sediment transport is anticipated in the stormwater runoff reaching the infiltration systems, appropriate measures to prevent or collect sediment shall be installed prior to discharge.

(f) Infiltration systems shall not be situated within 50 feet of any sewage bed or stream. They shall have a minimum setback of 15 feet from any residential structure, and if possible, shall be situated down gradient from such structures.

(g) All surface and subsurface infiltration systems shall have positive overflow controls, and storage volumes shall be computed from this invert.

(h) All infiltration systems shall be designed to empty the total design storm volume within 24 hours or less following rainfall.

(i) All subsurface infiltration systems shall utilize a permeable geotextile to separate aggregate beds or structures from soil, to prevent loss of bed capacity.

(6) Maintenance of best management practices.

(a) A description of maintenance activities and a maintenance schedule and management plan for best management practices shall be submitted and made part of the Stormwater Management Plan.

(b) Individual lot best management facilities are the responsibility of each lot owner. Their performance shall be guaranteed with a written and executed maintenance agreement with perpetual deed restrictions. This agreement must provide assurances that no action will be taken by the lot owner to disrupt in any way or impair the effectiveness of the best management facilities. This agreement must be attached to and made part of the building permit requirements for the lot.

(c) Where Doylestown Township has accepted an offer of dedication, including maintenance responsibilities for stormwater management facilities, a financial security and/or maintenance fee shall be provided by the developer.

E. Design criteria for drainage channels and swales.

- (1) All drainage channels shall be designed to prevent erosion of the bed and banks.
- (2) The maximum permissible flow velocity shall not exceed those outlined in Table 1.

TABLE 1

ALLOWABLE WATER VELOCITIES

Permissible velocities for channels lined with vegetation¹
The values apply to average, uniform stands of each type of cover.

Permissible Velocity (feet per second)

Cover	Slope Range ² (percent)	Erosion-Resistant Soils	Easily Eroded Soils
Bermuda grass	0-5	3	6
	5-10	7	5
	Over 10	6	4
Buffalo grass, Kentucky bluegrass, smooth brome or blue grama	0-5	7	5
	5-10	6	4
	Over 10	5	3
Grass mixture ²	0-5	5	4
	5-10	4	3
Lespedeza sericea ³ , weeping love grass ³ , yellow bluestem ³ , kudzu, alfalfa ³ or crabgrass ³	0-5	3.5	2.5
Common lespedeza ⁴ or Sudan grass ⁴	0-5	3.5	2.5

NOTES:

1Use velocities exceeding five feet per second only where good covers and proper maintenance can be obtained.

2Do not use on slopes steeper than 10% except for side slopes on a combination channel.

3Do not use on slopes steeper than 5% except for side slopes in a combination channel.

4Annuals: used on mild slopes or as temporary protection until permanent covers are established. Use on slopes steeper than 5% is not recommended.

(3) Suitable stabilization shall be provided where required to prevent erosion of the drainage channels.

(4) Any vegetated drainage channel requiring mowing of the vegetation shall have a maximum grade of four horizontal to one vertical on those areas to be mowed.

F. Design criteria for stormwater collection and pipe system.

(1) Storm sewers, culverts and related installations shall be provided:

(a) To permit the unimpeded flow of natural watercourses in such a manner as to protect the natural character of said watercourses and to provide regulated discharge.

(b) To ensure adequate drainage of all low points along the line of streets.

- (c) To intercept stormwater runoff along streets at intervals reasonably related to the extent and grade of the area drainage and to prevent substantial flow of water across intersections.
- (2) The design discharge from drainage areas contributing to the system may be determined by use of the rational equation ($Q = CIA$) when the total drainage area does not exceed 100 acres.
- (a) The following runoff factors shall be utilized for the rational equation:

Description of Area	Runoff Coefficient (C)
Residential	
2-acre single-family detached lots	0.40
1-acre single-family detached lots	0.46
1/2-acre single-family detached lots	0.50
1/4-acre single-family detached lots	0.56
Two-family and multifamily	0.70
Commercial	0.75
Industrial	0.80
Parks and cemeteries	0.38
Unimproved	0.35

Where the table is not applicable, the following factors may be used:

Roofs and all impervious surfaces	0.90
All other surfaces except forest	0.40
Forest	0.30

- (b) The coefficients in the above tabulations are applicable for storms of ten-year frequency and less. The coefficients are based on the assumption that the design storm does not occur when the ground is frozen. Less frequent, higher-intensity storms will require the use of higher coefficients.
- (c) For less frequent storms the coefficients can be used if they are multiplied by the following factors for the return frequency required:

Storm Frequency (years)	Factors
10 and less	1.0
25	1.1
50	1.2

- (d) The rainfall intensity I-curves presented in Figure 1 shall be used in determining stormwater runoff.
Editor's Note: Figure 1 is included at the end of this chapter.
- (e) Storm frequency.
 - [1] A ten-year storm frequency shall be used for the design of all stormwater systems.
 - [2] In all cases where storm drainage is picked up by means of a headwall or inlet structure and hydraulic inlet or outlet conditions control, the pipe shall be designed as a culvert for a twenty-five-year storm.
- (f) Storm duration.
 - [1] A five-minute storm duration shall be used if this duration does not result in a maximum expected discharge that exceeds the capacity of a thirty-inch pipe.
 - [2] If a five-minute storm duration results in a pipe size exceeding 30 inches, the time of concentration approach shall be used in determining storm duration.
 - [3] If a five-minute storm duration results in a pipe size exceeding 30 inches within any run of pipe, the time of concentration approach may be used for sizing of pipes from that point on by adjusting the time of concentra-

tion.