

*Township of Hopewell, NJ  
Friday, November 13, 2020*

## Chapter 17. Land Use and Development

### Article VI. DESIGN STANDARDS

#### § 17-82. DRAINAGE, DETENTION, AND STORMWATER MANAGEMENT.

[Ord. #04-1325, § 3; Ord. #05-1352]

a. Drainage.

1. All off-street traffic facilities, parking facilities, loading areas, passageways, driveways, walks, roofs, and other similar impervious surfaces, as well as all lands which have been so changed in contour or permeability as to alter or quicken the natural flow of surface waters, shall be so drained as to prevent damage or hazard to the site or to abutting properties or public streets. The design of all drainage facilities shall address water quality, flooding and groundwater recharge and shall incorporate the use of nonstructural stormwater management strategies to the maximum extent practicable.
2. Adequate surface and stormwater drainage facilities, (i.e. conduits and swales) shall be provided. The facilities shall be designed for the following minimum flow capacities:

| Drainage Basin Size  | Design Storm Frequency |
|----------------------|------------------------|
| 0 to 100 acres       | 25 years               |
| Over 100 acres       | 50 years               |
| Watercourse Crossing | 100 years              |

The facilities shall also comply with the Soil Erosion and Sediment Control Chapter **12**. All pipes shall be sized and located such that backwater or headwaters shall not flow onto roadways, sewage disposal fields, or within building setback areas.

3. No change shall be made in the existing contours of the land, and no construction shall take place, which would result in any change in the rate, course, width, or elevation of any natural or other drainage channel, in any manner that would obstruct, interfere with or change the drainage of such land, taking into account land development that may take place in the vicinity, except insofar as adequate drainage is provided. In addition, stormwater runoff shall not be concentrated over driveways or within 20 feet of a dwelling.
4. Land contours, drainage facilities, detention basins, and other pertinent aspects of each proposed development shall be designed to encourage as well as to provide effective soil erosion and sediment control.
5. The pipe size shall be determined by acceptable drainage design procedures. In no case shall the pipe size in a surface water drainage system be less than 15 inches in diameter.

6. Drainage inlets shall be located on both sides of street at all intersections. Surface runoff in streets shall not exceed six cubic feet per second at the drainage inlet and surface runoff in parking, loading, and walkway areas shall not exceed three cubic feet per second. Access manholes shall be placed at maximum 500-foot intervals throughout the system and at pipe junctions where there are no drainage inlets. Inlets shall be placed at intervals not exceeding 400 feet.
7. Storm drain pipes shall be constructed longitudinally along streets and shall cross streets perpendicular to the centerline thereof. Pipe shall be located under or behind the curblin with the installation of inlet or manhole structures. Curvilinear alignments, i.e. curved pipe, pipe bends, or tees, wyes, etc. shall not be permitted.
8. Storm drain pipes shall be the size specified and laid to the exact lines and grades approved by the township engineer. Specifications for construction of manholes, inlets, and storm drains shall conform with the 1983 N.J.D.O.T. Standard Specifications for Road and Bridge Construction, as amended or supplemented or the Site Improvement Standards of the Township of Hopewell, with the more restrictive applying.
9. Lots shall be graded to provide proper drainage away from all buildings, to prevent the ponding of stormwater on each lot or adjacent lots. Minimum slopes of 1.5% shall be provided on all lots except in the vicinity of structures, where 2% shall be maintained for a minimum of 20 feet. All lots shall be designed to convey stormwater from adjacent lots around the perimeter of the lot in question by use of stable diversion (swales) or waterways designed in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.
10. Land designated as a flood hazard area shall not be designed for any occupancy nor for any other purpose which may endanger life or property or aggravate the flood hazard. Such land may be considered for yard areas, or other similar uses and shall be preserved by a conservation easement.
11. Any underground drainageway or drainage systems outside a street or other public right-of-way shall be accompanied by a fifteen-foot wide (minimum) drainage easement dedicated to the township and conforming with the lines of such system. Sufficient width shall be provided so as to accommodate maintenance vehicle access.
12. Stream corridors shall be preserved by a conservation easement. Stream corridors extend 50 feet from each bank of permanently flowing streams as these streams are shown on Soil Conservation Service (SCS) maps. If the natural floodplain is greater, the corridor shall extend to the limits of the floodplain. Stream corridors shall also be extended to include contiguous wetlands and slopes over 12% where the toe of the slope is within 20 feet of the wet soils. Within the stream corridor and 20 feet of its edge, natural coverage shall be maintained, no alteration of the natural terrain shall occur, and no structures or impervious surfaces shall be constructed. All roads and utilities, including septic systems, shall be at least 100 feet from stream corridors.
  - (a) Stream corridors as defined in Section **17-181** shall be preserved by a conservation easement, which shall specify the prohibited uses and contain the customary provisions for a conservation easement as required by the township committee.
13. In such cases in which an easement extends into a lot for a distance wider than that which is restricted against building by the required yard space regulations of this chapter, the planning board may require the lot to be enlarged to the degree necessary to provide additional building area.
14. Sump pump discharge lines may be connected to the storm drain system upon approval of the superintendent of public works, but in no event shall sump pumps be connected to any sanitary sewer system. Sump pump connections shall be made using the standard detail provided in the site improvement standards.

15. Septic systems shall not be connected to the storm drain system. Where perimeter drains are provided around septic systems for the sole purpose of lowering the water table, the discharge pipe may be connected to the storm drainage system after receiving approval from the board of health and township engineer. Provision shall be made by the applicant to permit adequate inspection and testing of the discharge from this line.
  16. Stormwater Management. All hydraulic and hydrologic computations for all site development, subdivisions and site disturbances shall be in accordance with N.J.A.C. 7:8-5 and N.J.A.C. 5:21.
  17. Materials used in the construction of storm sewers shall be of reinforced concrete, ductile iron, corrugated aluminum, or corrugated steel. Site or other conditions may dictate alternative materials or design methods, which will be reviewed case by case by the township engineer. Specifications referred to, such as ASA, ASTM, AWWA, etc., should be the latest revision.
  18. Wetlands shall be preserved by conservation easements.
- b. Detention and Stormwater Management.
1. Shall be in accordance with N.J.A.C. 7:8-5 and N.J.A.C. 5:21.
  2. Detention basins shall be appropriately landscaped. All detention basin landscaping shall be designed by a New Jersey licensed landscape architect. Floor and side slope areas within the basin and subject to submergence shall be planted with low maintenance, water-tolerant ground cover. Nursery stock and multileader trees shall be used along the perimeter of the basin and side slopes not subjected to submergence. Shade tree planting along any portions of a berm shall not be permitted.
  3. Point discharges onto private property shall require a maintenance easement to a hydraulically stable condition. Minimum width shall be as determined by the township engineer based on type of access and maintenance required. The minimum length shall be measured to the point of calculated stability or 100 feet minimum as measured from the termination point of the outlet pipe headwall or flared end section.
  4. Submissions. All data required by this paragraph shall be provided in form and content, in accordance with the stormwater management checklist items for preliminary major subdivisions in the Land Use and Development Ordinance, section **17-125**.
  5. Maintenance and Repair. Responsibility for operation and maintenance of detention facilities, including periodic removal and disposal of accumulated particulate material and debris, shall remain with a homeowners' association, with permanent arrangements that it shall pass to any successive association, unless dedicated to the township along with a contribution to the township of sufficient funds to provide for the maintenance of such property for a period of 25 years from the date of planning board approval in accordance with the formula set forth hereafter. These arrangements shall designate for each project, the property owner, governmental agency, or other legally established entity to be permanently responsible for maintenance, hereinafter in this section referred to as the "responsible person."
- Prior to granting approval to any project subject to review under this section, the applicant shall execute the standard detention basin easement and detention basin maintenance agreement with the municipality to ensure the continued operation and maintenance of the detention facility. The easement shall be in the standard form contained with the site improvement standards which may be amended from time to time to include or alter provisions relating to personal guarantees, deed restrictions, covenants, and bonds. In cases where a homeowners' association or similar permanent entity is established as the responsible entity, a detention basin maintenance agreement shall be prepared. This document shall incorporate detention basin maintenance standards of the Township of

Hopewell and shall be executed with the association and all association documents shall address the provisions herein.

The funds to be contributed for the perpetual care of detention facilities dedicated to the township shall be computed in accordance with the following formula:

| Item No. | Description                     | Rate Per Acre | Total Acres | Freq. Per Year | Item Total |
|----------|---------------------------------|---------------|-------------|----------------|------------|
| 1        | Mowing                          | \$63.42       |             | 10             |            |
| 2        | Mowing Materials                | \$14.33       |             | 10             |            |
| 3        | Landscape Maintenance           | \$389.16      |             | 2              |            |
| 4        | Landscape Maintenance Materials | \$779.92      |             | 2              |            |
| 5        | General Maintenance             | \$219         | 1.0         | 4              |            |
| 6        | Periodic Maintenance            | \$4,835       |             | 0.076          |            |
| 7        | Engineering Inspection          | \$250.00      |             | 1              |            |

|  |   |          |
|--|---|----------|
| Estimated Annual Maintenance Costs   | = | \$ _____ |
| Estimated Annual Insurance Costs   | = | \$ _____ |
| Total Estimated Annual Detention Basin Costs (ADBC)  | = | \$ _____ |
| To Determine Developer Contribution, Compute 25 Year Present Worth of ADBC (Assume 6% Inflation and 8% Rate of Return) = ADBC x 18.665 | = | \$ _____ |
| Developer Contribution   | = | \$ _____ |

| Computation Factors Description |                        |   |
|---------------------------------|------------------------|---|
| Item                            | Description            |   |
| 1                               | Mowing:                | This item anticipates all labor and equipment necessary for maintaining an average lawn height of 4 inches including fertilizing and mobilization. Rates per acre are based upon site work cost data for labor and equipment as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates. Frequency reflects the number of times per annum in order to achieve an average lawn height of 4 inches.  |
| 2                               | Mowing Materials:      | This item anticipates all materials to be used for mowing and fertilizing. This item includes gas, oil, and disposal of grass clippings and fertilizer. Frequency shall be same as item 1. Mowing material rates are based upon site work cost data as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates.  |
| 3                               | Landscape Maintenance: | This item anticipates all labor and equipment necessary for mulching. Frequency reflects number of times performance of this item is anticipated annually. Landscape maintenance rates are based upon site work cost data for labor and equipment as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates.  |
| 4                               | Landscape Materials:   | This item anticipates all materials to be used for landscape maintenance. Landscape material rates are based upon site work cost data as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates   |
| 5                               | General Maintenance:   | This item anticipates all labor and equipment necessary to perform removal of debris around the outlet structure and its receiving waterway and to insure proper functioning of the basin. Frequency is based upon frequency of a 25 year storm event. 25 year storms generally produce such volumes and velocities of runoff that can carry debris which could be entrapped within the basin thereby interfering with the operation of the outlet structure General maintenance rates are based upon site work cost data for labor and equipment as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates |

| Computation Factors Description |                         |  |
|---------------------------------|-------------------------|--|
| Item                            | Description             |  |
| 6                               | Periodic Maintenance:   | This item anticipates capital expenditures which might occur during the 25 year period. These costs are assumed to be required during the 12th and 25th years. This item anticipates all labor, equipment, and materials necessary to perform this type of maintenance which may include but is not limited to: replacement of low flow channel, replacement of rusted elements of outlet structure, restoration of conduit outlet protection. In order to properly convert these costs to present worth, it is necessary to introduce a frequency factor which is less than 1. Periodic maintenance rates are based upon site work cost data for labor and equipment as provided by R.S. Mean Company, Inc. and as compared to prevailing local rates |
| 7                               | Engineering Inspection: | This item anticipates all labor and materials necessary to contract for performance of an inspection of the facility and receive a certificate of adequacy or statement of deficiencies by a New Jersey licensed professional engineer. The frequency of this item shall be once per year. Engineering inspection rates are based upon site work cost data for labor and equipment as provided by R.S. Mean Company, Inc., and as compared to prevailing local rates   |

Editor's Note: Exhibits D-1, D-2 and D-3, which were previously included here, are included as attachments to this chapter.