

## Chapter 100. Subdivision of Land

### Article XA. Stormwater Management

[Added 11-13-2006 by Ord. No. 2006-15<sup>[1]</sup>]

[1] *Editor's Note: This ordinance superseded former Art. XA, Stormwater Management, added 3-20-2006 by Ord. No. 2006-4.*

#### § 100-42.1. Purpose and applicability.

##### A. General.

- (1) It is hereby determined that the waterways within the Township of Delanco are at times subjected to flooding; that such flooding is a danger to the lives and property of the public; that such flooding is also a danger to the natural resources of the Township of Delanco, the county and the state; that development tends to accentuate flooding by increasing stormwater runoff, due to alteration of the hydrologic response of the watershed in changing from the undeveloped to the developed condition; that such increased flooding produced by the development of real property contributes increased quantities of waterborne pollutants, and tends to increase channel erosion; that such increased flooding, increased erosion, and increased pollution constitutes deterioration of the water resources of the Township of Delanco, the county and the state; and that such increased flooding, increased erosion and increased pollution can be controlled to some extent by the regulation of stormwater runoff from such development.
- (2) Design of the stormwater management system shall be consistent with general and specific concerns, values and standards of the municipal Master Plan and applicable county, regional and state storm drainage control programs, including Mosquito Commission control standards, if applicable. Design shall be based on environmentally sound site planning and engineering techniques.
- (3) The best available technology shall be used to minimize off-site stormwater runoff, increase on-site infiltration, encourage natural filtration functions, simulate natural drainage systems and minimize off-site discharge of pollutants to groundwater and surface water. Best available technology may include measures such as retention basins, recharge trenches, porous paving and piping, contour terraces and swales.

B. Purpose. It is the purpose of this article to establish minimum stormwater management requirements and controls for "major development," as defined in § 100-42.2.

##### C. Applicability.

- (1) This article shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:
  - (a) Nonresidential major developments; and
  - (b) Aspects of residential major developments that are not preempted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

(2) This article shall also be applicable to all major developments undertaken by the Township of Delanco.

D. Compatibility with other permit and ordinance requirements. Development approvals issued for subdivisions and site plans pursuant to this article are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this article shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This article is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law except that, where any provision of this article imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

#### § 100-42.2. Definitions.

Unless specifically defined below, words or phrases used in this article shall be interpreted so as to give them the meaning they have in common usage and to give this article its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

**CAFRA CENTERS, CORES OR NODES**

Those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

**CAFRA PLANNING MAP**

The geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

**COMPACTION**

The increase in soil bulk density.

**CORE**

A pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

**COUNTY REVIEW AGENCY**

An agency designated by the Burlington County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

- A. A county planning agency; or
- B. A county water resource association created under N.J.S.A 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

**DEPARTMENT**

The New Jersey Department of Environmental Protection.

**DESIGNATED CENTER**

A State Development and Redevelopment Plan Center as designated by the State Planning Commission such as urban, regional, town, village, or hamlet.

**DESIGN ENGINEER**

A person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

**DEVELOPMENT**

The division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, "development" means any activity that requires a state permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A 4:1C-1 et seq.

**DRAINAGE AREA**

A geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving water body or to a particular point along a receiving water body.

**EMPOWERMENT NEIGHBORHOOD**

A neighborhood designated by the Urban Coordinating Council "in consultation and conjunction with" the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

**ENVIRONMENTALLY CRITICAL AREAS**

An area or feature which is of significant environmental value, including but not limited to stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and wellhead protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

**EROSION**

The detachment and movement of soil or rock fragments by water, wind, ice or gravity.

**IMPERVIOUS SURFACE**

A surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

**INFILTRATION**

The process by which water seeps into the soil from precipitation.

**MAJOR DEVELOPMENT**

Any development that provides for ultimately disturbing one or more acres of land or would create 1/4 acre or more of impervious surface. "Disturbance," for the purpose of this rule, is the placement of impervious surface or exposure and/or movement of soil or bedrock or the clearing, cutting, or removing of vegetation.

**MITIGATION**

An action by an applicant providing compensation or offset actions for on-site stormwater management requirements where the applicant has demonstrated the inability or impracticability of strict compliance with the stormwater management requirements set forth in NJAC 7:8, in an adopted regional stormwater management plan, or in this article, and has received a waiver from strict compliance from the municipality. Mitigation, for the purposes of this article, includes both the mitigation plan, detailing how the project's applicant's failure to strictly comply will be compensated, and the implementation of the approved mitigation plan within the same HUC-14 subwatershed within which the subject project is proposed (if possible and practical), or a contribution of funding toward a regional stormwater management plan, or provision for equivalent treatment at an alternative location, or other equivalent water quality benefit.

**MUNICIPALITY**

The Township of Delanco.

**NODE**

An area designated by the State Planning Commission concentrating facilities and activities, which are not organized in a compact form.

**NUTRIENT**

A chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

**PERSON**

Any individual, corporation, company, partnership, firm, association, the Township of Delanco, or political subdivision of this state subject to municipal jurisdiction pursuant to the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.

**POLLUTANT**

Any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance [except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. § 2011 et seq.)], thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, groundwaters or surface waters of the state or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

**RECHARGE**

The amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

**SEDIMENT**

Solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

**SITE**

The lot or lots upon which a major development is to occur or has occurred.

**SOIL**

All unconsolidated mineral and organic material of any origin.

**STATE DEVELOPMENT AND REDEVELOPMENT PLAN METROPOLITAN PLANNING AREA (PA1)**

An area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state's future redevelopment and revitalization efforts.

**STATE PLAN POLICY MAP**

The geographic application of the state development and redevelopment plan's goals and statewide policies, and the official map of these goals and policies.

**STORMWATER**

Water resulting from precipitation, including rain and snow, that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities, or conveyed by snow removal equipment.

**STORMWATER MANAGEMENT BASIN**

An excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

#### **STORMWATER MANAGEMENT MEASURE**

Any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal nonstormwater discharges into stormwater conveyances.

#### **STORMWATER RUNOFF**

Water flow on the surface of the ground or in storm sewers, resulting from precipitation.

#### **TIDAL FLOOD HAZARD AREA**

A flood hazard area which may be influenced by stormwater runoff from inland areas but which is primarily caused by the Atlantic Ocean.

#### **TIME OF CONCENTRATION**

The time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed.

#### **TOTAL SUSPENDED SOILS**

The sum of dissolved and undissolved solids and particulate matter of a buoyancy and/or specific gravity that prohibits their settling in runoff.

#### **URBAN COORDINATING COUNCIL EMPOWERMENT NEIGHBORHOOD**

A neighborhood given priority access to state resources through the New Jersey Redevelopment Authority.

#### **URBAN ENTERPRISE ZONE**

A zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et seq.

#### **URBAN REDEVELOPMENT AREA**

Previously developed portions of areas:

- A. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
- B. Designated as CAFRA Centers, Cores or Nodes;
- C. Designated as Urban Enterprise Zones; and
- D. Designated as Urban Coordinating Council Empowerment Neighborhoods.

#### **WATERS OF THE STATE**

The ocean and its estuaries, all springs, streams, wetlands, and bodies of surfacewater or groundwater, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

#### **WETLANDS or WETLAND**

An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as "hydrophytic vegetation."

### **§ 100-42.3. General standards.**

#### **A. Design and performance standards for stormwater management measures.**

- (1) Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in § 100-42.4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.
- (2) The standards in this article apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or water quality management plan adopted in accordance with Department rules.

- (3) For site improvements regulated under the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21, the RSIS shall apply in addition to this section except to the extent the RSIS are superseded by this section or alternative standards applicable under a regional stormwater management plan or water quality management plan adopted in accordance with the rules of the New Jersey Department of Environmental Protection.

## § 100-42.4. Stormwater management requirements for major development.

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with § 100-42.1.
- B. Stormwater management measures shall avoid the adverse impacts on habitat for threatened and endangered species in Delanco Township, including but not limited to the foraging area of the bald eagle, which has been documented in the New Jersey Department of Environmental Protection's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 13:1B-15.147.
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § 100-42.4F and G:
  - (1) The construction of an underground utility line, provided that the disturbed areas are revegetated upon completion;
  - (2) The construction of an aboveground utility line, provided that the existing conditions are maintained to the maximum extent practicable; and
  - (3) The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § 100-42.4F and G may be obtained for the enlargement of an existing public roadway or railroad, or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
  - (1) The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
  - (2) The applicant demonstrates, through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of § 100-42.4F and G to the maximum extent practicable;
  - (3) The applicant demonstrates that, in order to meet the requirements of § 100-42.4F and G, existing structures currently in use, such as homes and buildings, would need to be condemned; and
  - (4) The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under § 100-42.4D(3) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of § 100-42.4F and G, that were not achievable on site.
- E. Nonstructural stormwater management strategies.
  - (1) To the maximum extent practicable, the standards in § 100-42.4F and G, shall be met by incorporating nonstructural stormwater management strategies set forth at § 100-37.3(E) into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project.
    - (a) The applicant shall submit a completed New Jersey Nonstructural Stormwater Management Strategies Point System (NSPS) worksheet with the land development application demonstrating that sufficient nonstructural stormwater management measures have been provided for the project.
    - (b) If the NSPS worksheet fails to demonstrate such compliance or the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in § 100-42.4E(2) below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention. A completed low impact development (LID) checklist shall then be submitted providing alternatives analysis for each measure.
    - (c) The NSPS worksheet can be obtained from the Department by visiting the following webpage: [www.njstormwater.org](http://www.njstormwater.org). The LID checklist is contained in Appendix A of the New Jersey Stormwater Best Management Practices Manual, which can also be obtained at the aforementioned webpage.
  - (2) Nonstructural stormwater management strategies incorporated into site design shall:
    - (a) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

- (b) Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
  - (c) Maximize the protection of natural drainage features and vegetation;
  - (d) Minimize the decrease in the "time of concentration" from pre-construction to post-construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;
  - (e) Minimize land disturbance, including clearing and grading;
  - (f) Minimize soil compaction;
  - (g) Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
  - (h) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
  - (i) Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:
    - [1] Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy § 100-42.4E(3) below;
    - [2] Site design features that help to prevent discharge of trash and debris from drainage systems;
    - [3] Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
    - [4] When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.
- (3) Site design features identified under § 100-42.4E(2)(I)[2] above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this subsection, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see § 100-42.4E(3)(c) below:
- (a) Grates.
    - [1] Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:
      - [a] The New Jersey Department of Transportation (NJDOT) bicycle-safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or
      - [b] A different grate, if each individual clear space in that grate has an area of no more than seven square inches or is no greater than 0.5 inch across the smallest dimension.
    - [2] Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
  - (b) Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven square inches or be no greater than two inches across the smallest dimension.
  - (c) This standard shall not apply under the following conditions or situations:
    - [1] Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;
    - [2] Where flows from the water quality design storm as specified in § 100-42.4G(1) are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:

- [a] A rectangular space 4 5/8 inches long and 1 1/2 inches wide (this option does not apply for outfall netting facilities); or
    - [b] A bar screen having a bar spacing of 0.5 inch.
  - [3] Where flows are conveyed through a trash rack that has parallel bars with one-inch spacing between the bars, to the elevation of the water quality design storm as specified in § 100-42.4G(1);
  - [4] Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.
- (4) Any land area used as a nonstructural stormwater management measure to meet the performance standards in § 100-42.4F and G shall be dedicated to a government agency, subjected to a conservation restriction filed with the Burlington County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.
- (5) Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in § 100-42.7 or found on the New Jersey Department of Environmental Protection's website at [www.njstormwater.org](http://www.njstormwater.org).
- F. Erosion control, groundwater recharge and runoff quantity standards.**
- (1) This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.
- (a) The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.
  - (b) The minimum design and performance standards for groundwater recharge are as follows:
    - [1] The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at § 100-42.4, either:
      - [a] Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100% of the average annual pre-construction groundwater recharge volume for the site; or
      - [b] Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.
    - [2] This groundwater recharge requirement does not apply to projects within an urban redevelopment area or to projects subject to Subsection F(1)(b)[3] below.
    - [3] The following types of stormwater shall not be recharged:
      - [a] Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied; areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department-approved remedial action work plan or landfill closure plan; and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
      - [b] Industrial stormwater exposed to source material. "Source material" means any material(s) or machinery, located at an industrial facility that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
    - [4] The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.
  - (c) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at § 100-42.4, complete one of the following:

- [1] Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two-, ten- and one-hundred-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
  - [2] Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two-, ten- and one-hundred-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;
  - [3] Design stormwater management measures so that the post-construction peak runoff rates for the two-, ten- and one-hundred-year storm events are 50%, 75% and 80%, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or
  - [4] In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsection F(1)(c)[1], [2] and [3] above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.
- (2) Any application for a new agricultural development that meets the definition of "major development" at § 100-42.2 shall be submitted to the Burlington County Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Burlington Conservation District guidelines for stormwater runoff quantity and erosion control. For the purposes of this section, "agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

**G. Stormwater runoff quality standards.**

- (1) Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80% of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollution Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under an NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of nonstructural and structural stormwater management measures.

**Table 1: Water Quality Design Storm Distribution**

<b>Time (minutes)</b>	<b>Cumulative Rainfall (inches)</b>	<b>Time (minutes)</b>	<b>Cumulative Rainfall (inches)</b>
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

- (2) For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual and other sources of technical guidance may be obtained from the address identified in § 100-42.7 or found on the Department's website at [www.njstormwater.org](http://www.njstormwater.org). TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design



engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, P.O. Box 418, Trenton, New Jersey 08625-0418.

- (3) If more than one BMP in series is necessary to achieve the required eighty-percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (A \times B)/100$$

Where

- R = Total TSS percent load removal from application of both BMPs.  
A = The TSS percent removal rate applicable to the first BMP.  
B = The TSS percent removal rate applicable to the second BMP.

**Table 2: TSS Removal Rates for BMPs**

<b>Best Management Practice</b>	<b>TSS Percent Removal Rate</b>
Bioretention systems	90%
Constructed stormwater wetland	90%
Extended detention basin	40% to 60%
Infiltration structure	80%
Manufactured treatment device	50% to 90%
Sand filter	80%
Vegetative filter strip	60% to 80%
Wet pond	50% to 90%

- (4) If there is more than one on-site drainage area, the eighty-percent TSS removal rate shall apply to each drainage area, unless the runoffs from the subareas converge on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.
- (5) Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in § 100-42.4F and G.
- (6) In accordance with the definition of "FW1" at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.
- (7) Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC-14 drainage area. These areas have been established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:
- (a) The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
- [1] A three-hundred-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the center line of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession.
- [2] Encroachment within the designated special water resource protection area under Subsection G(7)(a)[1] above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or center line of the waterway where the bank is undefined. All encroachments proposed under this subsection shall be subject to review and approval by the Department.
- (b) All stormwater shall be discharged outside of but may flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq.

- (c) If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard for Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:
- [1] Stabilization measures shall not be placed within 150 feet of the Category One waterway;
  - [2] Stormwater associated with discharges allowed by this section shall achieve a ninety-percent TSS post-construction removal rate;
  - [3] Temperature shall be addressed to ensure no impact on the receiving waterway;
  - [4] The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
  - [5] A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
  - [6] All encroachments proposed under this section shall be subject to review and approval by the Department.
- (d) A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to § 100-42.4G(7) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to § 100-42.4G(7) shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in § 100-42.4G(7)(a)[1] above. In no case shall a stream corridor protection plan allow the reduction of the special water resource protection area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.
- (e) Section 100-42.4G(7) does not apply to the construction of one individual single-family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

## § 100-42.5. Calculation of stormwater runoff and groundwater recharge.

A. Stormwater runoff shall be calculated in accordance with the following:

(1) The design engineer shall calculate runoff using one of the following methods:

- (a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 — Hydrology and Technical Release 55 — Urban Hydrology for Small Watersheds; or
- (b) NRCS Computer Program for Project Formulation — Hydrology, Technical Release No. 20 (TR-20); or
- (c) HEC-HMS Hydrology Modeling System, Version 2.2, May 2003, Hydraulic Engineering Center, published by the U.S. Army Corps of Engineers, used in appropriate conditions with appropriate values; or
- (d) The Rational Method for peak flow and the Modified Rational Method for hydrograph computations. The use of the Rational Method and Modified Rational Method is limited to drainage areas of 20 acres or less with generally uniform surface cover and topography.
  - [1] The Rational Method and Modified Rational Method are most accurate when dealing with uniform drainage areas. Design engineers may divide nonuniform drainage areas into "uniform" subdrainage areas and calculate the runoff from each of these areas separately, or they may use the weighted average technique for a composite drainage area. Design engineers may use runoff coefficients from the following sources, incorporated herein by reference:
    - [a] Table 7.1, "Typical Runoff Coefficients (C Values) for One-Hundred-Year Frequency Storm" of the Residential Site Improvement Standards at N.J.A.C. 5:21, February 7, 2005, as supplemented or amended to date.
    - [b] HEC-22 Urban Drainage Design Manual, Second Edition, FHWA-NHI-01-021, August 2001, U.S. Department of Transportation, Federal Highway Administration, as supplemented or amended to date.

[c] New Jersey Department of Transportation (NJDOT) Roadway Design Manual, November 2001, as revised through March 28, 2003.

[2] Design engineers may estimate time of concentration (tc) for storm sewers with Figure 7.1, "Time of Concentration," of the Residential Site Improvement Standards, N.J.A.C. 5:21, February 7, 2005, as supplemented or amended to date. For other purposes, design engineers shall use the procedures outlined in Chapter 3 of the runoff calculation method in § 100-42.5A(1)(a).

[3] Rainfall intensity as a function of duration and storm frequency shall be based upon Figure 7.2, "Rainfall Intensity Curves," of the Residential Site Improvement Standards, N.J.A.C. 5:21, February 7, 2005, as supplemented or amended to date, and/or local rainfall frequency data, where available, for the two-, ten-, twenty-five- and one-hundred-year storm events. Design engineers may substitute local rainfall frequency data, when available. Design engineers shall use cumulative and incremental rainfall distributions listed in Table 1 of § 100-42.4G for the water quality design storm.

- (2) For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology at § 100-42.5A(1)(a) and the Rational and Modified Rational Methods at § 100-42.5A(1)(d). A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).
- (3) In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts that may reduce pre-construction stormwater runoff rates and volumes.
- (4) In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 — Urban Hydrology for Small Watersheds and other methods may be employed.
- (5) If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.
- (6) In using the NRCS methods for computation of stormwater runoff, the DELMARVA unit hydrograph shall be utilized in areas defined in the New Jersey Department of Agriculture, State Soil Conservation Committee, Technical Bulletin 2004-2.0, adopted on July 12, 2004.
- (7) Design storm rainfall depths for use in the NRCS methods shall comply with the NRCS twenty-four-hour Design Storm Rainfall Depths Table (NJ), Revised 2004, as supplemented or amended to date.

B. Groundwater recharge may be calculated in accordance with the following:

- (1) The New Jersey Geological Survey Report GSR-32, A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual at <http://www.state.nj.us/dep/njgs> or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427, Trenton, New Jersey 08625-0427; (609) 984-6587.

C. Design of storm sewer systems, culverts, channels or other conveyance structures shall be based on the peak rate of discharge. These facilities shall be designed, at a minimum, for the following storm frequencies:

- (1) Ten-year storm for storm drain systems where excess flow, up to the one-hundred-year storm, can continue downgrade in the street and not exceed the gutter capacity. Also, ten-year storm shall be used at low points in storm drain systems with overlaid relief that is routed through the stormwater quantity control structure.
- (2) Twenty-five-year storm where flow in a storm drain is totally carried by pipe when conditions under § 100-42.5C(1) above do not apply, provided overlaid relief up to the one-hundred-year storm is routed through the stormwater quantity control structure.
- (3) Twenty-five-year storm for culvert design where the culvert will be located in streams shown on the New Jersey State Atlas or the United States Coast and Geodetic Survey Maps. Culverts with an upstream drainage area of 50 acres or

more shall be designed to accommodate the one-hundred-year frequency storm in accordance with Flood Hazard Control Regulations, N.J.A.C. 7:13-2.16.

- (4) Twenty-five-year storm for open channels where the upstream drainage area is less than 50 acres. When the upstream drainage area is 50 acres or more, open channels shall be designed to accommodate the one-hundred-year frequency storm in accordance with Flood Hazard Control Regulations, N.J.A.C. 7:13-2.16.

## § 100-42.6. Standards for structural stormwater management measures.

### A. Standards for structural stormwater management measures are as follows:

- (1) Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).
- (2) Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than 1/3 the width of the diameter of the orifice or 1/3 the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of § 100-42.8B.
- (3) Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 5:21-7.4, and 5:21-7.5 shall be deemed to meet this requirement.
- (4) At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of 2 1/2 inches in diameter.
- (5) Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at § 100-42.8 and the standards of N.J.A.C. 5:21-7.8.

### B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized, provided that the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by § 100-42.4 of this article.

### C. Manufactured treatment devices may be used to meet the requirements of § 100-42.4 of this article, provided the New Jersey Corporation verifies the pollutant removal rates for Advanced Technology and certified by the Department.

## § 100-42.7. Sources for technical guidance.

### A. Technical guidance for stormwater management measures can be found in the documents listed at Subsection A(1) and (2) below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey 08625; telephone (609) 777-1038.

- (1) Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.
- (2) The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

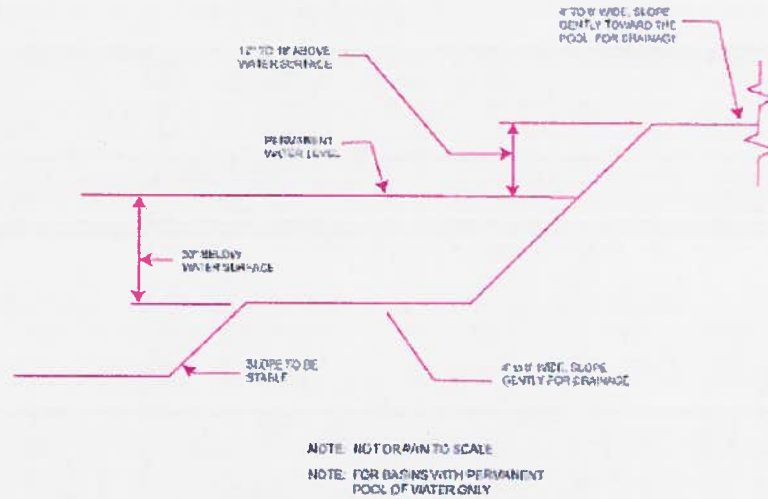
### B. Additional technical guidance for stormwater management measures can be obtained from the following:

- (1) The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4.
- (2) The Rutgers Cooperative Extension Service, (732) 932-9306; and
- (3) The Burlington County Soil Conservation District located at Tiffany Square, Suite 100, 1289 Route 38, Hainesport, NJ 08036; (609) 267-7410.

## § 100-42.8. Safety standards for stormwater management basins.

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.
- B. Requirements for trash racks, overflow grates and escape provisions.
- (1) A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:
    - (a) The trash rack shall have parallel bars, with no greater than six-inch spacing between the bars.
    - (b) The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
    - (c) The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.
    - (d) The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant and shall be designed to withstand a perpendicular live loading of 300 pounds per foot squared.
  - (2) An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
    - (a) The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.
    - (b) The overflow grate spacing shall be no less than two inches across the smallest dimension.
    - (c) The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant and shall be designed to withstand a perpendicular live loading of 300 pounds per foot squared.
  - (3) For purposes of this subsection, "escape provisions" means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:
    - (a) If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in § 100-42.8C, a freestanding outlet structure may be exempted from this requirement.
    - (b) Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than 2 1/2 feet. Such safety ledges shall be comprised of two steps. Each step shall be four feet to six feet in width. One step shall be located approximately 2 1/2 feet below the permanent water surface, and the second step shall be located one foot to 1 1/2 feet above the permanent water surface. See § 100-42.80 for an illustration of safety ledges in a stormwater management basin.
    - (c) In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than three horizontal to one vertical.
- C. Variance or exemption from safety standards. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.
- D. Illustration of safety ledges in a new stormwater management basin.

Depicted is an elevational view.



### § 100-42.9. Pipe capacity, materials and placement.

Design of open-channel or closed conduit stormwater conveyance systems shall be designed and constructed in accordance with N.J.A.C. 5:21-7.3, as supplemented or amended to date.

### § 100-42.10. Inlets, catch basins, manholes and outlets.

- A. Stormwater structures including inlets, catch basins and manholes shall be designed and constructed in accordance with N.J.A.C. 5:21-7.3, as supplemented or amended to date.
- B. In order to allow the municipality to plan for storm conveyance system management, the name of the municipality, the year, and the words "STORM SEWER" shall be cast integrally in all manhole covers.
- C. Inlets and catch basins which may connect or ultimately discharge to a municipal stormwater conveyance system and/or water body (ditch, creek, stream, lake, pond, river, etc.) shall be labeled with a graphic and text complying with the requirements of the current Township storm drain inlet labeling program and/or at the direction of the Public Works Department (e.g., "NO DUMPING, DRAINS TO RIVER").

### § 100-42.11. Requirements for site development stormwater plan.

- A. Submission of site development stormwater plan.
  - (1) Whenever an applicant seeks municipal approval of a development subject to this article, the applicant shall submit all of the required components of the checklist for the site development stormwater plan at § 100-42.11C as part of the submission of the applicant's application for subdivision or site plan approval.
  - (2) The applicant shall demonstrate that the project meets the standards set forth in this article.
  - (3) The applicant shall submit 13 copies of the materials listed in the checklist for site development stormwater plans in accordance with § 100-42.11C of this article.
- B. Site development stormwater plan approval. The applicant site development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from whom municipal approval is sought. That municipal board or official shall consult the engineer retained by the Joint Land Use Board to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this article.
- C. Checklist requirements. The following information shall be required:
  - (1) Topographic Base Map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the Topographic Base Map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of one inch equals 200 feet or greater, showing two-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams, waterways that drain into or upstream of the Category One waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other

wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and man-made features not otherwise shown.

- (2) Environmental site analysis. A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.
- (3) Project description and site plan(s). A map (or maps) at the scale of the Topographical Base Map indicating the location of areas of impervious surface, including, but not limited to, existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification of proposed changes in natural conditions shall also be provided.
- (4) Land use planning and source control plan. This plan shall provide a demonstration of how the goals and standards of §§ 100-42.3 through 100-42.6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.
- (5) Stormwater Management Facilities Map. The following information, illustrated on a map of the same scale as the Topographic Base Map, shall be included:
  - (a) Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.
  - (b) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.
- (6) Calculations.
  - (a) Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in § 100-42.4.
  - (b) When the proposed stormwater management control measures (e.g., infiltration basins) depend on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on-site boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.
- (7) Maintenance and repair plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of § 100-42.4.
- (8) Waiver from submission requirements. The municipal official or board reviewing an application under this article may, in consultation with the Joint Land Use Board engineer, waive submission of any of the requirements in § 100-42.11C(1) through C(6) of this article when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.
- (9) Site plan checklist. Major development applications shall require the applicant shall complete and submit a copy of the Site Conditions Checklist, which can be found immediately following this chapter.

## § 100-42.12. Maintenance and repair.

- A. Applicability. Projects subject to review as in § 100-42.1C shall comply with the requirements of § 100-42.10B and C.
- B. General maintenance.
  - (1) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
  - (2) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's

agreement to assume this responsibility or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

- (3) Responsibility for maintenance shall not be assigned or transferred to the municipality in a residential development or project unless approved by the Joint Land Use Board. Responsibility for facilities located in institutional, industrial, commercial or other nonresidential development sites shall be the owner of the site. A named individual shall be responsible for the safety and maintenance of said facility. The posting of a two-year maintenance guarantee in accordance with N.J.S.A. 40:55D-53 shall be required for all facilities not dedicated to the municipality or other public agency.
  - (4) Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.
  - (5) If the person responsible for maintenance identified under § 100-42.12B(2) above is not a public agency, the maintenance plan and any future revisions based on § 100-42.12B(8) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
  - (6) Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
  - (7) The person responsible for maintenance identified under § 100-42.12B(2) above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.
  - (8) The person responsible for maintenance identified under § 100-42.12B(2) above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed and submit such changes for approval by the Township Engineer.
  - (9) The person responsible for maintenance identified under § 100-42.12B(2) above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by § 100-42.12B(7) and (8) within 10 days of such a request.
  - (10) The requirements of § 100-42.12B(4) and (5) do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.
  - (11) In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or county may immediately proceed to do so and shall bill the cost thereof to the responsible person.
- C. Nothing in this section shall preclude Delanco Township from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

### § 100-42.13. Violations and penalties.

- A. Failure to comply with any provisions of this section shall be considered a violation of the Code of Delanco Township. Any person, firm or corporation found to be in violation of the provisions of this chapter shall be punishable as provided in Chapter 1, General Provisions, Article II, of Delanco's adopted Code, entitled "General Penalty."

### § 100-42.14. When effective.

This article shall take effect immediately upon the approval by the county review agency or 60 days from the receipt of the ordinance by the county review agency if the county review agency should fail to act.

### § 100-42.15. Severability.

If the provisions of any section, subsection, paragraph, subdivision, or clause of this article shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this article.



## § 100-42.16. Fees.

All subdivision and site plan review fees associated with this article shall be provided by the applicant as adopted by the Township Committee and established within Chapter 60, Fee and Escrow Schedule, of the Code.

## § 100-42.17. Mitigation plan.

### A. Standards.

- (1) For the purposes of this section, "mitigation" shall incorporate the definition set forth in § 100-42.2 of this article and shall include situations where the applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in NJAC 7:8, in addition to the requirements set forth in this article.
- (2) The board having jurisdiction over an application requiring a stormwater management plan shall have the jurisdiction to grant a waiver from strict compliance with the performance requirements of this article or the stormwater management plan. The waiver may be granted where an applicant has demonstrated the inability or impracticality of strict compliance with the ordinance and/or the stormwater management plan upon the following conditions. The applicant must demonstrate one of the following:
  - (a) An inability to apply any of the best management practices and methodologies as defined and approved herein and in the stormwater management plan; due to an extraordinary and exceptional situation uniquely affecting the subject property or structures thereon, resulting in a peculiar and exceptional practical difficulty or undue hardship; or
  - (b) That the purposes of this article and stormwater management plan can be advanced by a deviation from the best management practices and methodologies as defined and approved herein and in the stormwater management plan, where the benefits of such deviation substantially outweigh any detriment.
- (3) In requesting a waiver as to any application, the applicant may submit as reasons for the waiver the site conditions of the proposed project, including soils types; thin soil cover; low-permeability soils, and/or shallow depths to groundwater (high groundwater levels), unique conditions which would create an unsafe design, or conditions which would provide a detrimental impact to public health, welfare, or safety.
- (4) The waiver cannot be granted due to conditions created by the applicant. If the applicant can comply with the requirements of the chapter and stormwater management plan through reducing the size of a project, the hardship is self-imposed, and therefore the board lacks jurisdiction to grant any waiver under this section.
- (5) The applicant must propose a suitable mitigation method through the submission of a mitigation plan which will conform as closely as possible to the design and performance standards of this article, through structural or nonstructural stormwater management measures, governing stormwater quality, quantity, and groundwater recharge. Approval of a waiver or exemption from any one of the three stormwater design standard criteria which include groundwater recharge, water quality, and water quantity provides no guarantee that, if requested, an exemption or waiver will be granted for either or both of the remaining criteria.
- (6) Supporting evidence for an exemption or waiver shall be prepared in the form of a stormwater management report which will be signed and sealed by a New Jersey licensed professional engineer. The report shall include, at a minimum:
  - (a) Detailed hydrologic and hydraulic calculations identifying the sizing criteria for each BMP and the stormwater collection system based upon the anticipated peak flow and/or volume.
  - (b) A map of the planned project showing existing conditions with drainage boundaries and land features, including delineated wetlands, proposed improvements, including all BMPs, grading, utilities, impervious features, and landscaping.
  - (c) Construction details for each BMP with appropriate contact information.

### B. Mitigation criteria. The mitigation criteria are listed below in order of preference:

- (1) Identify, design, and implement a compensating measure to mitigate impacts. The preferred option is to identify and develop a compensating mitigation project in the same drainage area as the proposed development. In these cases, the applicant will address the same issue within the design and performance standards for which the variance or exemption is being sought and demonstrate that the proposed mitigating measures provide equal or greater compensation to offset the noncomplying aspect of the stormwater management system on site. The developer must also ensure the long-term maintenance of the project as outlined in Chapters 8 and 9 of the NJDEP Stormwater BMP Manual. If the Township agrees to control a new stormwater management facility, arrangement in the form of an

escrow account will be made to stipulate the payment amount, schedule, and long-term responsibilities of the facility to ensure that it functions to capacity.

- (2) Complete a project identified by the municipality as equivalent to the environmental impact created by the exemption or variance. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Subsection B(1), the mitigation project may provide measures that are not directly equivalent to the impacts for which the variance or exemption is being sought but that address the same issue to an equal or greater extent. For example, if a variance is given because the eighty-percent TSS requirement has not been met, the selected project may address water quality impacts that increase the siltation of a water body within the applicable HUC-14 subwatershed.
- (a) Delanco has identified and ranked the following projects to mitigate existing groundwater recharge, water quality, and water quantity stormwater management problems that exist within the Township. The applicant can select from one or more of the projects listed below to provide compensatory mitigation for a project that is unable to comply with the Township's stormwater design and performance standards. Further, more-detailed information on the projects can be obtained from the Municipal Engineer.

<b>Delanco Township Water Quality Improvement Projects</b>			
<b>Rank</b>	<b>Name</b>	<b>Problem</b>	<b>Mitigation Alternative</b>
1	Boggs Ditch	Tidally influenced creek which experiences flooding due to siltation from adjacent development and debris from Delaware River and natural sources	Establish riparian buffer along Boggs's ditch and retrofit proximate stormwater basins to filter runoff.
2	Hickory and Poplar Street Drainage System	Storm pipe collection system has insufficient means to convey stormwater (pipe size and/or clogging). Upstream areas near park experience flooding.	Retrofit existing infrastructure to improve stormwater quality to reduce clogging and alleviate flooding.
3	Oakford Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
4.	Center Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
5	Union Avenue Outfall	Swale at outfall captures debris from river and continually blocks pipe outfall. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
6	Edgewood Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
7	Glitters Gulch	Storm outfall experiences clogging from debris from river. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
8	Rivers Edge Drive Outfall	Neighboring properties encroaching on sides of outfall location causing pool at discharge location which captures debris from river. Upstream areas experience flooding when system is clogged.	Contribute to the study and development of improving drainage conveyance along the Rivers Edge outfall.

<b>Delanco Township Water Quantity Improvement Projects</b>			
<b>Rank</b>	<b>Name</b>	<b>Remarks</b>	<b>Mitigation Alternative</b>
1	Boggs Ditch	Tidally influenced creek which experiences flooding due to siltation from adjacent development and debris from Delaware River and natural sources	Establish riparian buffer along Boggs's ditch and retrofit proximate stormwater basins to filter runoff.

<b>Delanco Township Water Quantity Improvement Projects</b>			
<b>Rank</b>	<b>Name</b>	<b>Remarks</b>	<b>Mitigation Alternative</b>
2	Hickory and Poplar Street Drainage System	Storm pipe collection system has insufficient means to convey stormwater (pipe size and/or clogging). Upstream areas near park experience flooding.	Retrofit existing infrastructure to improve stormwater quality to reduce clogging and alleviate flooding.
3	Oakford Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
4	Center Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
5	Union Avenue Outfall	Swale at outfall captures debris from river and continually blocks pipe outfall. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
6	Edgewood Avenue Outfall	Headwall at outfall in poor condition and separating from pipe. Debris from river continually enters pipe and clogs it. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
7	Glitters Gulch	Storm outfall experiences clogging from debris from river. Upstream areas experience flooding when system is clogged.	Retrofit existing outfall structure to reduce clogging and alleviate flooding.
8	Rivers Edge Drive Outfall	Neighboring properties encroaching on sides of outfall location causing pool at discharge location which captures debris from river. Upstream areas experience flooding when system is clogged.	Contribute to the study and development of improving drainage conveyance along the Rivers Edge outfall.

<b>Delanco Township Groundwater Recharge Mitigation Improvement Projects</b>			
<b>Rank</b>	<b>Name</b>	<b>Remarks</b>	<b>Mitigation Alternative</b>
1	Boggs Ditch	Tidally influenced creek which experiences flooding due to siltation from adjacent development and debris from Delaware River and natural sources	Establish riparian buffer along Boggs's ditch and retrofit proximate stormwater basins to filter runoff.
2	Hickory and Poplar Street Drainage System	Storm pipe collection system has insufficient means to convey stormwater (pipe size and/or clogging). Upstream areas near park experience flooding.	Retrofit existing infrastructure to improve stormwater quality to reduce clogging and alleviate flooding.
3	Rivers Edge Drive Outfall	Neighboring properties encroaching on sides of outfall location causing pool at discharge location which captures debris from river. Upstream areas experience flooding when system is clogged.	Contribute to the study and development of improving drainage conveyance along the Rivers Edge outfall.

- (b) Mitigation projects can utilize a number of BMPs to offset the stormwater management of a project that is unable to comply with the new design standards. However, these BMPs, which may include sand filters, vegetative filters, or the incorporation of a manufactured treatment device, among other possibilities, will be engineered and applied on a site-by-site basis. In general, the engineering necessary to determine the mitigative measure that is most suited for a particular basin is the responsibility of the applicant and must be determined and submitted along with the particular project's site plan.
- (c) An appropriate mitigation measure may take place within the larger confines of a proposed project's HUC-14 subwatershed area, or another portion of the Township, rather than the contributory drainage area within which the proposed project is located if the Delanco Township Joint Land Use Board finds that the mitigation will equally protect public health, safety and welfare, the environment, and public and private property.

- (3) Provide funding for municipal projects that would address existing stormwater impacts. The third and least preferable stormwater mitigation option is for the applicant to provide funding or partial funding for an environmental enhancement project that has been identified in the municipal stormwater management plan or towards the development of a regional stormwater management plan. The contributed funds must be equal or greater than the cost to implement the required on-site stormwater measure for which relief is requested, including the cost of land, easements, engineering design, and long-term maintenance. However, with this option, Delanco Township, not the applicant, is ultimately responsible for the design, property acquisition, construction, construction management, maintenance (short-term and long-term) and follow-up study, unless that project and its prospective costs have been outlined within this mitigation plan.
- C. Requirements for mitigation projects. Whether the applicant is proposing the mitigation project, or Delanco Township has identified the project within this mitigation plan, the following requirements for mitigation must be included in the project submission:
- (1) Impact from noncompliance. The applicant must provide a table to show the required values, and the values provided in the project, and include an alternatives analysis that demonstrates that on-site compliance was maximized to the greatest extent practicable.
  - (2) Narrative and supporting information regarding the need for the waiver. The waiver cannot be granted for a condition that was created by the applicant. If the applicant can provide compliance with the stormwater rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued. The applicant must provide a discussion and supporting information of the site conditions that would not allow the construction of stormwater management facility to provide compliance with these requirements and/or if the denial of the application would impose an extraordinary hardship on the applicant brought about by circumstances peculiar to the subject property. The site conditions to be considered are soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare, and safety.
  - (3) Sensitive receptor. Identify the sensitive receptor related to the performance standard for which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive receptor.
  - (4) Design of the mitigation project. Provide the design details of the mitigation project. This includes, but is not limited to, drawings, calculations, and other information needed to evaluate the mitigation project.
  - (5) Responsible party. The mitigation project submission must list the party or parties responsible for the construction or maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party is aware of, has authority to perform, and accepts the responsibility for the construction and the maintenance of the mitigation project. Under no circumstances shall the responsible party be an individual single-family homeowner.
  - (6) Maintenance. The applicant must include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5 as part of a mitigation plan. In addition, if the maintenance responsibility is being transferred to Delanco Township or another entity, the entity responsible for the cost of the maintenance must be identified. Delanco provides applicants with the option of conveying the mitigation project to the Township, provided that the applicant funds the cost of maintenance of the facility in perpetuity.
  - (7) Permits. The applicant is solely responsible to obtain any and all necessary local, state, or other applicable permits for the identified mitigation project or measure. The applicable permits must be obtained prior to the municipal approval of the project for which the mitigation is being sought.
  - (8) Construction. The applicant must demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate of occupancy or final approval by the municipality for the application permit cannot be issued until the mitigation project or measure receives final approval. Any mitigation projects proposed by the municipality to offset the stormwater impacts of the Township's own projects must be completed within six months of the completion of the municipal project in order to remain in compliance with Delanco's NJPDES general permit.