

## ORDINANCE NO. 7, 2021

AN ORDINANCE AMENDING CHAPTER 238 STORMWATER MANAGEMENT OF THE CODE OF THE CITY OF LINWOOD AND REPEALING ALL ORDINANCES HERETOFORE ADOPTED, THE PROVISIONS OF WHICH ARE INCONSISTENT HEREWITH.

BE IT ORDAINED, by the Common Council of the City of Linwood, County of Atlantic and State of New Jersey as follows:

SECTION 1: Chapter 238, Stormwater Management is hereby amended to read as follows:

### Article I **General Regulations**

#### § 238-1 **Title.**

This chapter shall be known and may be cited as the "Stormwater Management Ordinance."

#### § 238-2 **Policy, purpose and applicability.**

A. Policy statement. [**Amended 9-25-2013 by Ord. No. 16-2013**]

- (1) Reduce flood damage, including damage to life and property;
- (2) Minimize, to the extent practical, any increase in stormwater runoff from any new development;
- (3) Reduce soil erosion from any development or construction project;
- (4) Assure the adequacy of existing and proposed culverts and bridges, and other in stream structures;
- (5) Maintain groundwater recharge;
- (6) Prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- (7) Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- (8) Minimize pollutants in stormwater runoff from new and existing development in order to restore, enhance and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water;
- (9) Protect public safety through the proper design and operation of stormwater management basins; and
- (10) Flood control, groundwater recharge, and pollutant reduction shall be achieved through the use of stormwater management measures, including green infrastructure Best Management Practices (GI

BMPs) and nonstructural stormwater management strategies. GI BMPs and low impact development (LID) should be utilized to meet the goal of maintaining natural hydrology to reduce stormwater runoff volume, reduce erosion, encourage infiltration and groundwater recharge, and reduce pollution. GI BMPs and LID should be developed based upon physical site conditions and the origin, nature and the anticipated quantity, or amount, of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose.

- (1) It is hereby determined that the lakes and waterways within the City of Linwood of Atlantic County may be subject to flooding; that development tends to accentuate the possibility of such flooding by increasing stormwater runoff, due to alterations of the hydrologic response of the watershed in changing from the undeveloped to the developed condition; that such increased stormwater runoff produced by development of real property contributes to the possibility of increased quantities of waterborne pollutants and tends to increase channel erosion; that such increased stormwater runoff, increased erosion potential and increased pollution potential constitutes the possibility of the deterioration of the water resources of the City of Linwood, the County of Atlantic and the State of New Jersey; and that such impacts can be controlled to some extent by the regulation of stormwater runoff from such development. It is determined that it is in the public interest to regulate the development of real property and to establish standards to regulate the additional discharge of stormwater runoff from such developments as provided in this chapter.
- (2) It is the purpose of this chapter to be consistent with established minimum stormwater management requirements and controls for major development, in accordance with N.J.A.C. 5:21, New Jersey Residential Site Improvement Standards, and N.J.A.C. 7:8, Stormwater Management Rules. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (3) In addition, this chapter seeks to expand those same minimum stormwater management requirements for certain developments not defined as "major development." **[Added 9-25-2013 by Ord. No. 16-2013]**

C. Applicability.

- (1) For "major development" N.J.A.C. 5:21, New Jersey Residential Site Improvement Standards, N.J.A.C. 7:8, Stormwater Management Rules, and the requirements of this chapter shall apply. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (2) For the following non-major development, the rules of this chapter (excluding § 238-5) shall apply: **[Amended 9-25-2013 by Ord. No. 16-2013]**
  - (a) Applications to the Planning Board; **[Amended 4-11-2018 by Ord. No. 6-2018]**
  - (b) New construction of one or more residential dwelling units.

- (3) All other non-major development shall comply with this chapter (excluding § **238-5**), except that a stormwater management plan shall not be required. The lack of stormwater management plan in these instances shall not relieve any property owner, developer, building, contractor, etc. from the requirements of this chapter. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (4) This ordinance shall also be applicable to all major developments undertaken by the City of Linwood.
- (5) The applicant may request a waiver from the strict compliance with the standards if it can be demonstrated and documented that the enforcement of one or more of these standards will cause an undue hardship.
- (6) These standards shall apply unless more strict controls have been established by other agencies having jurisdiction. In those areas, the strictest standard shall control.

D. Procedure.

- (1) Burden of proof. Whenever an applicant seeks a City approval of a development to which this chapter is applicable from any board or official of the City, that applicant shall be required to demonstrate that the project meets the standards set forth in this chapter, including a stormwater management plan. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (2) Submission materials due. The applicant shall submit materials, as required by this chapter hereof, to the City Board or official from which the applicant seeks City approval prior to or at the same time of submission of an application for City approval. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (3) Review. The applicant's project shall be reviewed by the City Board or official from which the applicant seeks City approval. That City Board or official shall consult with the City Engineer to determine if the project meets the standards set forth in this chapter. A \$500 escrow fee will be assessed for the City's review of the stormwater management plan. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (4) Time for decision. The City Board or official shall promptly determine if the project meets the standards set forth in this chapter. The time for that determination should be the time permitted to review and act on the applicant's application for a City approval.
- (5) Failure to comply. Failure of the applicant to demonstrate that the project meets the standards set forth in this chapter is reason to deny the applicant's underlying application for a City approval.
- (6) Variance. For good reason, the City may grant a waiver of the standards given in this chapter. **[Amended 9-25-2013 by Ord. No. 16-2013]**

E. Goals and objectives. In order to protect, maintain and enhance both the immediate and long-term health and general welfare of its citizens, Linwood established the following goals and objectives for stormwater control:

- (1) To ensure that stormwater runoff after development of a site will approximate the same rate of flow and

timing of stormwater runoff that would have occurred under predevelopment conditions.

- (2) To maintain the adequacy of existing and proposed culverts and bridges, dams and other conveyance structures.
  - (3) To minimize erosion and sedimentation from any development or construction project.
  - (4) To the maximum extent practicable, alleviate any deleterious drainage condition(s) on or adjacent to any site proposed for development.
- F. Compatibility with other permit and ordinance requirements. Development approvals issued for subdivisions and site plans pursuant to this chapter 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 chapter shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This chapter is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this chapter 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.

#### **§ 238-3 Definitions.**

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter 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.

#### **BMP**

Best management practice as defined in the New Jersey Stormwater Best Management Practices Manual.

#### **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.

#### **COMMUNITY BASIN**

An infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond, established in accordance with N.J.A.C. 7:8-4.2(c)14, that is designed and constructed in accordance with the New Jersey Stormwater Best Management Practices Manual, or an alternate design, approved in accordance with N.J.A.C. 7:8-5.2(g), for an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond and that complies with the requirements of this chapter.

**COMPACTION**

The increase in soil bulk density.

**CONTRIBUTORY DRAINAGE AREA**

The area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

**CORE**

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

**COUNTY**

The County of Atlantic.

**COUNTY REVIEW AGENCY**

An agency designated by the County Board of Chosen Freeholders to review the City's stormwater management plans and implementing ordinance(s). The county review agency is the Atlantic County Department of Regional Planning and Development.

**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 City 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 City review of any activity not exempted by the Right to Farm Act, N.J.S.A. 4:1C-1 et seq.

**DISTURBANCE**

The placement or reconstruction of impervious surface or motor vehicle surface, or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation. Milling and repaving is not considered disturbance for the purposes of this definition.

### **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.

### **ENVIRONMENTALLY CONSTRAINED AREA**

The following areas where the physical alteration of the land is in some way restricted, either through regulation, easement, deed restriction or ownership such as: wetlands, floodplains, threatened and endangered species sites or designated habitats, and parks and preserves. 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.

### **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.

### **GREEN INFRASTRUCTURE**

A stormwater management measure that manages stormwater close to its source by:

1. Treating stormwater runoff through infiltration into subsoil;
2. Treating stormwater runoff through filtration by vegetation or soil; or
3. Storing stormwater runoff for reuse.

### **HUC 14 OR HYDROLOGIC UNIT CODE 14**

An area within which water drains to a particular receiving surface water body, also known as a subwatershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey.

### **IMPERVIOUS SURFACE**

Pursuant to N.J.A.C. 7:8-1.2, impervious surface means 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**

an individual “development,” as well as multiple developments that individually or collectively result in:

1. The disturbance of one or more acres of land since February 2, 2004;
2. The creation of one-quarter acre or more of “regulated impervious surface” since February 2, 2004;
3. The creation of one-quarter acre or more of “regulated motor vehicle surface” since March 2, 2021 *{or the effective date of this ordinance, whichever is earlier}*
4. A combination of 2 and 3 above that totals an area of one-quarter acre or more. The same surface shall not be counted twice when determining if the combination area equals one-quarter acre or more.

Major development includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually meet any one or more of paragraphs 1, 2, 3, or 4 above. Projects undertaken by any government agency that otherwise meet the definition of “major development” but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered “major development.”

#### **MOTOR VEHICLE**

Land vehicles propelled other than by muscular power, such as automobiles, motorcycles, autocycles, and low speed vehicles. For the purposes of this definition, motor vehicle does not include farm equipment, snowmobiles, all-terrain vehicles, motorized wheelchairs, go-carts, gas buggies, golf carts, ski-slope grooming machines, or vehicles that run only on rails or tracks.

#### **MOTOR VEHICLE SURFACE**

Any pervious or impervious surface that is intended to be used by “motor vehicles” and/or aircraft, and is directly exposed to precipitation including, but not limited to, driveways, parking areas, parking garages, roads, racetracks, and runways.

#### **CITY**

The City of Linwood.

#### **NEW CONSTRUCTION**

A development project that results in the issuance of a new certificate of occupancy before the area can be occupied.

**[Added 9-25-2013 by Ord. No. 16-2013]**

#### **NEW JERSEY STORMWATER BEST MANAGEMENT PRACTICES (BMP) MANUAL OR BMP MANUAL**

The manual maintained by the Department providing, in part, design specifications, removal rates, calculation methods, and soil testing procedures approved by the Department as being capable of contributing to the achievement of the stormwater management standards specified in this chapter. The BMP Manual is periodically amended by the Department as necessary to provide design specifications on additional best management practices and new information on already included practices reflecting

the best available current information regarding the particular practice and the Department's determination as to the ability of that best management practice to contribute to compliance with the standards contained in this chapter. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this chapter, provided the design engineer demonstrates to the municipality, in accordance with Section IV.F. of this ordinance and N.J.A.C. 7:8-5.2(g), that the proposed measure and its design will contribute to achievement of the design and performance standards established by this chapter.

#### **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 City of Linwood or political subdivision of this state subject to City jurisdiction pursuant to the City 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, City, 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.

#### **REGULATED IMPERVIOUS SURFACE**

Any of the following, alone or in combination:

1. A net increase of impervious surface;
2. The total area of impervious surface collected by a new stormwater conveyance system (for the purpose of this definition, a "new stormwater conveyance system" is a stormwater conveyance system that is constructed where one did not exist immediately prior to its construction or an existing system for which a new discharge location is created);
3. The total area of impervious surface proposed to be newly collected by an existing stormwater



conveyance system; and/or

4. The total area of impervious surface collected by an existing stormwater conveyance system where the capacity of that conveyance system is increased.

#### **REGULATED MOTOR VEHICLE SURFACE**

Any of the following, alone or in combination:

1. The total area of motor vehicle surface that is currently receiving water;
2. A net increase in motor vehicle surface; and/or quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant, where the water quality treatment will be modified or removed.

#### **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 development is to occur or has occurred.

[Amended 9-25-2013 by Ord. No. 16-2013]

#### **SOIL**

All unconsolidated mineral and organic material of any origin.

#### **SPECIAL WATER RESOURCE PROTECTION AREAS**

Pursuant to N.J.A.C. 7:8 — 5.5(h), 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. Areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, and exceptional fisheries significance of those established Category One waters.

#### **STATE**

The State of New Jersey.

#### **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 BMP**

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.

## **STORMWATER MANAGEMENT PLANNING AGENCY**

A public body authorized by legislation to prepare stormwater management plans.

## **STORMWATER MANAGEMENT PLANNING AREA**

The geographic area for which a stormwater management planning agency is authorized to prepare stormwater management plans, or a specific portion of that area identified in a stormwater management plan prepared by that agency.

## **TIDAL FLOOD HAZARD AREA**

A flood hazard area in which the flood elevation resulting from the two-, 10-, or 100-year storm, as applicable, is governed by tidal flooding from the Atlantic Ocean. Flooding in a tidal flood hazard area may be contributed to, or influenced by, stormwater runoff from inland areas, but the depth of flooding generated by the tidal rise and fall of the Atlantic Ocean is greater than flooding from any fluvial sources. In some situations, depending upon the extent of the storm surge from a particular storm event, a flood hazard area may be tidal in the 100-year storm, but fluvial in more frequent storm events.

## **WATER CONTROL STRUCTURE**

A structure within, or adjacent to, a water, which intentionally or coincidentally alters the hydraulic capacity, the flood elevation resulting from the two-, 10-, or 100-year storm, flood hazard area limit, and/or floodway limit of the water. Examples of a water control structure may include a bridge, culvert, dam, embankment, ford (if above grade), retaining wall, and weir.

## **WATERS OF THE STATE**

The ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or groundwater,

whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

## **WETLANDS**

Pursuant to N.J.A.C. 7:8-1.2, Wetlands or wetland means 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.

### **§ 238-4 General standards.**

A. Design and performance standards for stormwater management measures.

- (1) Stormwater management measures shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards stated in this section as well as those standards for stormwater management stated in § 238-5. 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. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (2) The standards stated in § 238-5 apply 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 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. **[Amended 9-25-2013 by Ord. No. 16-2013]**
- (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 Department rules.
- (4) All developments shall demonstrate through hydrologic and hydraulic analysis that quantity and quality standards are met as follows.
  - (a) The total volume of runoff leaving the site from the postdevelopment condition shall not be greater than the total volume of runoff leaving the site from the predevelopment condition, nor shall there be any alterations of the flow pattern of stormwater runoff from the lot such that flooding, erosion, sedimentation, loss of water supply or other harmful effect will occur.
  - (b) The volume of runoff resulting from the water quality design storm defined as 1.25 inches in a two-hour period or the one-year twenty-four-hour Type III design storm shall be completely retained and infiltrated on site.
- (5) Wetlands.

- (a) No land development shall be carried out within 50 feet of a wetland or in an area adjacent to a wetland area where the seasonal high-water table is three feet or less, unless the applicant can demonstrate that the proposed development will not result in significant adverse impact on any drainage structure.
- (b) A significant adverse impact shall be deemed to exist if:
  - [1] A drainage structure is affected through the increased runoff discharged to the wetlands;
  - [2] There is a change in the seasonal flow patterns;
  - [3] There is an alteration of the water table; or
  - [4] There is an increase in erosion and increased sedimentation of the wetlands.
- (6) Methods of management.
  - (a) The following is a list of various control methods which may be utilized in stormwater management systems, if appropriate. The choice of control techniques is not limited to the ones appearing on this list. However, it will be the policy of the City to encourage the use of retention basins wherever possible.
    - [1] Detention/retention basins.
    - [2] Rooftop storage.
    - [3] Parking lot ponding.
    - [4] Porous pavement and concrete lattice block surface.
    - [5] Grassed channels and vegetated strips.
    - [6] Routed flow over grass.
    - [7] Decreased impervious area coverage.
    - [8] French drains, porous pipes and dry wells.
  - (b) The use of other control methods which meet the criteria in this section will be permitted when approved by the Engineer. Various combinations of methods should be tailored to suit the particular requirements of the type of development and the topographic features of the project area.
- (c) Regardless of the method used, the applicant will be required to provide a maintenance plan in accordance with § **238-14**.
- (7) Drainage easements.
  - (a) All stormwater management plans shall illustrate the pathway of positive outflow to the nearest

stormwater easement, stream, lake, pond or other natural watercourse. Prior to receiving the final approval, the applicant shall obtain the necessary easements corresponding with the flow patterns illustrated on the plans should those patterns affect the present or future use of adjoining parcels by increasing the quantity of runoff over the adjoining parcel.

- (b) Where a subdivision is traversed by a watercourse, surface or underground drainageway or drainage system, channel or stream, there shall be provided and dedicated a drainage right-of-way easement to the City conforming substantially to the lines of such watercourse, and such further width or construction, or both, as will be adequate to accommodate expected stormwater runoff meeting any minimum widths and locations shown on any adopted Official Map and/or Master Plan and, as a minimum, that fixed in § **238-3** defined as "stream corridor." Such easement dedication shall be expressed on the plan as follows: "Drainage and utility right-of-way easement granted to the City of Linwood."
- (8) Drainage structures in county or state right-of-way. Drainage structures which are located within New Jersey or Atlantic County highway rights-of-way shall be approved by the state or county agency, and a letter from that office indicating such approval shall be directed to the administrator of the Planning Board and shall be received prior to the final plat approval. Drainage structures abutting a brook or stream whose drainage area, up to and including the subdivision or development, is greater than 50 acres or within a one-hundred-year floodplain shall be required to secure a stream encroachment permit from the New Jersey Department of Environmental Protection, Division of Water Resources, in accordance with the latest criteria, prior to authorization of final approval. A copy of said permit shall be forwarded to the Administrator of the Planning Board and attached to the final engineering plans.

**§ 238-5 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 development in accordance with § **238-14**. [Amended 9-25-2013 by Ord. No. 16-2013]
- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergi* (bog turtle).
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § **238-5G**:
  - (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 green infrastructure, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § **238-5G** 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 alternative analysis that, through the use of nonstructural and structural stormwater management strategies and measures, the alternative selected complies with the requirements of § **238-5G** to the maximum extent practicable;
- (3) The applicant demonstrates that, in order to meet the requirements of § **238-5G**, 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 Subsection **D(3)** above within the upstream drainage area of the receiving stream that would provide additional opportunities to mitigate the requirements of § **238-5G** that were not achievable on site.

E. Nonstructural stormwater management strategies.

- (1) To the maximum extent practicable, the standards in § **238-5G** shall be met by incorporating nonstructural stormwater management strategies set forth at § **238-7** into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Subsection **E(2)** below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.
- (2) If the applicant contends that it is not practical for engineering, environmental or safety reasons to incorporate any of the nine nonstructural strategies into the design of a particular project, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practical on the site. This rationale shall be submitted, in accordance with the checklist requirements established by § **238-13**, to the City. A determination by the City that this rationale is inadequate or without merit shall result in a denial of the application unless one of the following conditions is met:
  - (a) The land use planning and source control plan is amended to include a description of how all nine nonstructural measures will be implemented on the development site, and the amended plan is approved by the City;
  - (b) The land use planning and source control plan is amended to provide an alternative nonstructural strategy or measure that is not included in the list of nine nonstructural measures, but still meets the

performance standards in §§ **238-3** and **238-4**, and the amended plan is approved by the City; or

- (c) The land use planning and source control plan is amended to provide an adequate rationale for the contention that use of the particular strategy is not practical on the site, and the amended plan is approved by the City.
- (3) In addition to all other requirements of this section, each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved, protected and maintained according to the minimum standards established by provisions of the City Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval. Existing trees and vegetation shall be protected during construction activities in accordance with the standard for tree protection during construction provided in the New Jersey State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference, as amended and supplemented.
- (4) Any land area used as a nonstructural stormwater management measure to meet the performance standards in §§ **238-5** and **238-6** shall be dedicated to a government entity; shall be subjected to a conservation easement filed with the appropriate County Clerk's office; or shall be subjected to an equivalent form of restriction approved by the City that ensures that that measure, or equivalent stormwater management measure, is maintained in perpetuity, as detailed in § **238-14** of this chapter.
- (5) Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the NJDEP's Web site at [www.njstormwater.org](http://www.njstormwater.org).

F. Threatened and endangered species and associated habitat standards.

- (1) Stormwater management measures shall avoid adverse impacts of the development on habitat for threatened and endangered species, in accordance with N.J.A.C. 7:8-5.2(c).

G. Erosion control, groundwater recharge and runoff quantity and quality 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 at N.J.A.C. 2:90.
  - (2) The minimum design and performance standards for groundwater recharge are as follows:
    - (a) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at § **238-6**, either:

- [1] Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100% of the average annual preconstruction groundwater recharge volume for the

site; or

- [2] Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from preconstruction to postconstruction for the two-year storm is infiltrated.
- (b) The following types of stormwater shall not be recharged:
- [1] 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
  - [2] Industrial stormwater exposed to source material. "Source material" means any material(s) or machinery, located at an industrial facility, which 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.
- (c) 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.
- (3) The minimum design and performance standards for stormwater runoff quantity are as follows. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at § **238-6**, complete one of the following:
    - (a) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, postconstruction runoff hydrographs for the two-, ten- and one-hundred-year storm events do not exceed, at any point in time, the preconstruction runoff hydrographs for the same storm events;
    - (b) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the preconstruction 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;



- (c) Design stormwater management measures so that the postconstruction peak runoff rates for the two-, ten- and one-hundred-year storm events are 50%, 75% and 80%, respectively, of the preconstruction peak runoff rates. The percentages apply only to the postconstruction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed; or
- (d) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsections **G(3)(a)**, **G(3)(b)** and **G(3)(c)** above is required unless the design engineer demonstrates through hydrologic and hydraulic analysis that the increased volume, change in timing, or increased rate of the stormwater runoff, or any combination of the three will not result in additional flood damage below the point of discharge of the major development. No analysis is required if the stormwater is discharged directly into any ocean, bay, inlet, or the reach of any watercourse between its confluence with an ocean, bay, or inlet and downstream of the first water control structure.
- (4) The minimum design and performance standards for stormwater quality are as follows:
- (a) Stormwater management measures shall be designed to reduce the postconstruction load of total suspended solids (TSS) in stormwater runoff by 80% of the anticipated load, expressed as an annual average shall be achieved for the stormwater runoff from the net increase of motor vehicle surface. 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 a 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. The calculation of the volume of runoff may take into account the implementation of nonstructural and structural stormwater management measures.
- (b) For purposes of TSS reduction calculations, see § **238-6** for removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in § **238-8**, or found on the Department's Web site at [www.njstormwater.org](http://www.njstormwater.org). The BMP Manual and other sources of technical guidance are listed in § **238-11**. 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, PO Box 418, Trenton, New Jersey, 08625-0418.
- (c) 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

- (d) If there is more than one on-site drainage area, the eighty-percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.
- (e) Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the postconstruction 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 § 238-5G.
- (f) 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.
- (g) 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 HUC14 drainage area. These areas shall be 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:
  - [1] The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
    - [a] 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.
    - [b] Encroachment within the designated special water resource protection area under Subsection G(4)(g)[1][a] 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 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 subparagraph shall be subject to review and approval by the Department.
  - [2] All stormwater shall be discharged outside of and 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.

- [3] 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:
- [a] Stabilization measures shall not be placed within 150 feet of the Category One waterway;
  - [b] Stormwater associated with discharges allowed by this section shall achieve a ninety-five-percent TSS postconstruction removal rate;
  - [c] Temperature shall be addressed to ensure no impact on the receiving waterway;
  - [d] 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;
  - [e] A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
  - [f] All encroachments proposed under this section shall be subject to review and approval by the Department.
- [4] 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 the City through provisions in the adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway 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 shall maintain or enhance the current functional value and overall condition of the special water resource protection area. 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.
- (h) The stormwater runoff quality standards do not apply to the construction of one individual single-family dwelling, provided that it is not part of a larger development or subdivision that has received preliminary or final site plan approval prior to December 3, 2018, and that the motor vehicle surfaces are made of permeable material(s) such as gravel, dirt, and/or shells.

#### H. Green Infrastructure Requirements

- (1) When designed in accordance with the most current version of the New Jersey Stormwater Best

Management Practices Manual, the stormwater management measures found at N.J.A.C. 7:8-5.2 (f) Tables 5-1, 5-2 and 5-3 and listed below in Tables 1, 2 and 3 are presumed to be capable of providing stormwater controls for the design and performance standards as outlined in the tables below. Upon amendments of the New Jersey Stormwater Best Management Practices to reflect additions or deletions of BMPs meeting these standards, or changes in the presumed performance of BMPs designed in accordance with the New Jersey Stormwater BMP Manual, the Department shall publish in the New Jersey Registers a notice of administrative change revising the applicable table. The most current version of the BMP Manual can be found on the Department’s website at:

[http://njstormwater.org/bmp\\_manual2.htm](http://njstormwater.org/bmp_manual2.htm)

- (2) An alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate may be used if the design engineer demonstrates the capability of the proposed alternative rate or method to the municipality. A copy of any approved alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate shall be provided to the Department. Alternative stormwater management measures may be used to satisfy the requirements only if the measures meet the definition of green infrastructure. Alternative stormwater management measures that function in a similar manner to a BMP are subject to the contributory drainage area less than or equal to 2.5 acres, except for alternative stormwater management measures that function similarly to cisterns, grass swales, green roofs, standard constructed wetlands, vegetative filter strips, and wet ponds, which are not subject to a contributory drainage area limitation. Alternative measures that function similarly to standard constructed wetlands or wet ponds shall not be used for compliance with the stormwater runoff quality standard unless a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with **§238-5D**.
- (a) Where the BMP tables in the NJ Stormwater Management Rule are different due to updates or amendments with the tables in this ordinance the BMP Tables in the Stormwater Management rule at N.J.A.C. 7:8-5.2(f) shall take precedence.

<b>Table 1 Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity</b>				
<b>Best Management Practice</b>	<b>Stormwater Runoff Quality TSS Removal Rate (percent)</b>	<b>Stormwater Runoff Quantity</b>	<b>Groundwater Recharge</b>	<b>Minimum Separation from Seasonal High Water Table (feet)</b>
Cistern	0	Yes	No	--
Dry Well <sup>(a)</sup>	0	No	Yes	2
Grass Swale	50 or less	No	No	2 <sup>(e)</sup> 1 <sup>(f)</sup>

Green Roof	0	Yes	No	--
Manufactured Treatment Device <sup>(a) (g)</sup>	50 or 80	No	No	Dependent upon the device
Pervious Paving System <sup>(a)</sup>	80	Yes	Yes <sup>(b)</sup> No <sup>(c)</sup>	2 <sup>(b)</sup> 1 <sup>(c)</sup>
Small-Scale Bioretention Basin <sup>(a)</sup>	80 or 90	Yes	Yes <sup>(b)</sup> No <sup>(c)</sup>	2 <sup>(b)</sup> 1 <sup>(c)</sup>
Small-Scale Infiltration Basin <sup>(a)</sup>	80	Yes	Yes	2
Small-Scale Sand Filter	80	Yes	Yes	2
Vegetative Filter Strip	60-80	No	No	--

(Notes corresponding to annotations <sup>(a)</sup> through <sup>(g)</sup> are found at the end of Table 3)

<b>Table 2 Green Infrastructure BMPs for Stormwater Runoff Quantity (or for Groundwater Recharge and/or Stormwater Runoff Quality with a Waiver or Variance from N.J.A.C. 7:8-5.3)</b>				
<b>Best Management Practice</b>	<b>Stormwater Runoff Quality (SS Removal Rate percent)</b>	<b>Stormwater Runoff Quantity</b>	<b>Groundwater Recharge</b>	<b>Minimum Separation from Seasonal High Water Table (feet)</b>
Bioretention System	80 or 90	Yes	Yes <sup>(b)</sup> No <sup>(c)</sup>	2 <sup>(b)</sup> 1 <sup>(c)</sup>
Infiltration Basin	80	Yes	Yes	2
Sand Filter <sup>(b)</sup>	80	Yes	Yes	2
Standard Constructed Wetland	90	Yes	No	N/A
Wet Pond <sup>(d)</sup>	50-90	Yes	No	N/A

(Notes corresponding to annotations <sup>(b)</sup> through <sup>(d)</sup> are found at the end of Table 3)

<b>Table 3 BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity only with a Waiver or Variance from N.J.A.C. 7:8-5.3</b>				
<b>Best Management Practice</b>	<b>Stormwater Runoff Quality (SS Removal Rate percent)</b>	<b>Stormwater Runoff Quantity</b>	<b>Groundwater Recharge</b>	<b>Minimum Separation from Seasonal High Water Table (feet)</b>
Blue Roof	0	Yes	No	N/A
Extended Detention Basin	40-60	Yes	No	1
Manufactured Treatment Device <sup>(h)</sup>	50 or 80	No	No	Dependent upon the device
Sand Filter <sup>(c)</sup>	80	Yes	No	1
Subsurface Gravel Wetland	90	No	No	1
Wet Pond	50-90	Yes	No	N/A

Notes to Tables 1, 2, and 3:

- (a) subject to the applicable contributory drainage area limitation specified at §238-51(2);
- (b) designed to infiltrate into the subsoil;
- (c) designed with underdrains;
- (d) designed to maintain at least a 10-foot wide area of native vegetation along at least 50 percent of the shoreline and to include a stormwater runoff retention component designed to capture stormwater runoff for beneficial reuse, such as irrigation;
- (e) designed with a slope of less than two percent;
- (f) designed with a slope of equal to or greater than two percent;
- (g) manufactured treatment devices that meet the definition of green infrastructure at §238-3;
- (h) manufactured treatment devices that do not meet the definition of green infrastructure at §238-3.

## I. Green Infrastructure Standards

- (1) This subsection specifies the types of green infrastructure BMPs that may be used to satisfy the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards.

- (2) To satisfy the groundwater recharge and stormwater runoff quality standards at **§238-5G(2)** and **§238-5G(4)**, the design engineer shall utilize green infrastructure BMPs identified in Table 1 at **§238-5.H(2)(a)**. and/or an alternative stormwater management measure approved in accordance with **§238-5H(2)**. The following green infrastructure BMPs are subject to the following maximum contributory drainage area limitations:

<b>Best Management Practice</b>	<b>Maximum Contributory Drainage Area</b>
Dry Well	1 acre
Manufactured Treatment Device	2.5 acres
Pervious Pavement Systems	Area of additional inflow cannot exceed three times the area occupied by the BMP
Small-scale Bioretention Systems	2.5 acres
Small-scale Infiltration Basin	2.5 acres
Small-scale Sand Filter	2.5 acres

- (3) To satisfy the stormwater runoff quantity standards at **§238-5G(3)**, the design engineer shall utilize BMPs from Table 1 or from Table 2 and/or an alternative stormwater management measure approved in accordance with **§238-5H(2)**.
- (4) If a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with Section IV.D is granted from the requirements of this subsection, then BMPs from Table 1, 2, or 3, and/or an alternative stormwater management measure approved in accordance with **§238-5H(2)** may be used to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at **§238-5G(2)**, **§238-5G(3)** and **§238-5G(4)**.
- (5) For separate or combined storm sewer improvement projects, such as sewer separation, undertaken by a government agency or public utility (for example, a sewerage company), the requirements of this subsection shall only apply to areas owned in fee simple by the government agency or utility, and areas within a right-of-way or easement held or controlled by the government agency or utility; the entity shall not be required to obtain additional property or property rights to fully satisfy the requirements of this subsection. Regardless of the amount of area of a separate or combined storm sewer improvement project subject to the green infrastructure requirements of this subsection, each project shall fully comply with the applicable groundwater recharge, stormwater runoff quality control, and stormwater runoff quantity standards at **§238-5G(2)**, **§238-5G(3)** and **§238-5G(4)**, unless the project is granted a waiver from strict compliance in accordance with **§238-5D**.

**§ 238-6 Calculation of stormwater runoff quantity, quality and groundwater recharge.**

- A. Methods of calculating stormwater runoff quantity:

- (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 Chapters 7, 9, 10, 15 and 16 Part 630, Hydrology National Engineering Handbook, incorporated herein by reference as amended and supplemented. This methodology is additionally described in *Technical Release 55 – Urban Hydrology for Small Watersheds* (TR-55), dated June 1986 incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the Natural Resources Conservation Service website at:

[http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1044171.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf)

or at United States Department of Agriculture Natural Resources Conservation Service, 220 Davison Avenue, Somerset, New Jersey 08873; or

- (b) The Rational Method for peak flow and the Modified Rational Method for hydrograph computations. The rational and modified rational methods are described in “Appendix A-9 Modified Rational Method” in the Standards for Soil Erosion and Sediment Control in New Jersey, January 2014. This document is available from the State Soil Conservation Committee or any of the Soil Conservation Districts listed at N.J.A.C. 2:90-1.3(a)3. The location, address, and telephone number for each Soil Conservation District is available from the State Soil Conservation Committee, PO Box 330, Trenton, New Jersey 08625. This document is also available at:

<http://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf>

- (2) For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the preconstruction 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 § **238-6A(1)(a)** and the Rational and Modified Rational Methods at § **238-6A(1)(b)**. 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 preconstruction 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 preconstruction 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) Detention facilities. For the purpose of determining the total quantity of runoff prior to and following development, the Soil Conservation Service's Technical Release No. 55 shall be used. This methodology shall serve as the basis for determining total storage capacity required subject to the guidelines identified in previous sections of this report and will also serve as the basis for determining release rates from the one-year, two-year, ten-year and fifty-year storms.
- (7) Calculations shall be computed on the basis of all areas upstream of the parcel(s) in question. Peak rates of runoff shall be computed for the entire area and design release rates computed on the basis of preexisting conditions for the entire watershed.
- (8) The maximum curve number values suitable for use in computing runoff values for on-site developed conditions are as follows:

<b>Hydrologic Soil Group</b>	<b>Curve Number</b>
A	25
B	55
C	70
D	77

- (9) Rainfall values for each of the storms used in designing stormwater facilities include (Type III rainfall distribution):

<b>Storm Event</b>	<b>Total Rainfall (inches)</b>
1-year	2.8
2-year	3.3
10-year	5.2
50-year	7.6
100-year	8.9

- (10) The applicant must identify:
  - (a) The peak rate of runoff making adjustments as required for percent of impervious cover, alterations to hydraulic length and percentage of watershed and wetland as described in TR-55 and supplemented by notes provided by the Soil Conservation Service. The tabular method described in TR-55 shall be used for calculating runoff rates.

- (b) The total quantity of runoff utilizing the tabular hydrographic data contained in TR-55. Total quantities of runoff shall be estimated prior to and after development by calculating the total area under the hydrograph utilizing the hydrographic coefficients contained in TR-55.
  - (c) The relative timing of the peak rate of discharge following the onset of a storm shall be identified within the stormwater calculations.
- (11) Retention basins, detention basins and partial detention basins shall be sized by routing each of the required design storms using either reservoir routing or graphical methods.
- (12) For storm sewer design, the rational method ( $Q=CIA$ ) may be utilized for calculating runoff quantities subject to the following criteria. The minimum design requirements for storm sewers shall be the ten-year storm. Runoff generated by storms of greater intensity, up to and including the fifty-year storm, shall be directed towards detention basins or alternative stormwater facilities on the site:
- (a) The rainfall intensity (I) shall be computed as a function of the time of concentration by generally accepted procedures found in Seeyles, algebraic equations, Soil Conservation Service Engineering Field Manual, etc.
  - (b) The area (A) shall include all off-site acreage draining onto or through the site.
  - (c) The coefficient of runoff (C) shall not be less than the values stated below unless well documented and approved by the Engineer:

<b>Surface</b>	<b>Minimum "C"</b>
Structures, pavements	0.90
Cultivated dense or clay soils	0.30
Cultivated sand or loam soils	0.25
Meadows, rural areas	0.20
Heavily wooded areas	0.15

Overall drainage runoff factors will not, in general, be less than the following:

**Proposed Development -**

**Site Plans**

<b>Site Plans</b>	<b>Minimum "C"</b>
(To the limits of improvements)	0.70
1/4 acre residential	0.50
1/2 acre residential	0.40
1 acre residential	0.30

NOTE: The above tables are intended as minimum design standards. They are not mandated design criteria.

- (d) Velocities will be computed using Manning's equation or generally accepted nomographs for pipe flow. Pipes shall be designed flowing full without head conditions for the ten-year storm (minimum).

(e) Acceptable friction factors "n" are listed below:

- [1] Circular cross section concrete pipe 18 inches or less: 0.013.
- [2] Circular cross section concrete pipe 18 inches or larger: 0.015.
- [3] Concrete lined ditches: 0.015.
- [4] Clear unlined ditches: 0.25.
- [5] Natural stream and watercourses: 0.3.

(f) Other cross sections or pipe materials shall have commensurate friction factors as may be approved by the City Engineer or consultant.

B. Methods of calculating stormwater runoff quality.

- (1) In complying with the stormwater runoff quality standards in § 238-5G(4), the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 — Hydrology and Technical Release 55, Urban Hydrology for Small Watersheds, as amended and supplemented.
- (2) The design engineer shall also use the NJDEP water quality design storm, which is one and one-quarter inches of rainfall falling in a nonlinear pattern in two hours. Details of the water quality design storm are shown in Table 1 below.
- (3) Calculation of runoff volumes, peak rates, and hydrographs for the water quality design storm may take into account the implementation of nonstructural and structural stormwater management measures.

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

<b>Time</b>	<b>Cumulative Rainfall</b>
<b>(minutes)</b>	<b>(inches)</b>
0	0.0000
5	0.0083
10	0.0166
15	0.0250
20	0.0500
25	0.0750
30	0.1000
35	0.1330
40	0.1660

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

<b>Time</b>	<b>Cumulative Rainfall</b>
<b>(minutes)</b>	<b>(inches)</b>
45	0.2000
50	0.2583
55	0.3583
60	0.6250
65	0.8917
70	0.9917
75	1.0500
80	1.0840
85	1.1170
90	1.1500
95	1.1750
100	1.2000
105	1.2250
110	1.2384
115	1.2417
120	1.2500

Source N.J.A.C. 7:8 — 5.5 (A)

- (4) Total suspended solids (TSS) reduction calculations.
- (a) If more than one stormwater 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
- (5) TSS removal rates for stormwater BMPs.
- (a) For purposes of TSS reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. The BMP Manual may be obtained from the address identified in § 238-11 or found on the NJDEP's Web site at [www.njstormwater.org](http://www.njstormwater.org). TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2.
- (b) Alternative stormwater management measures, 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 City. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by the City and a copy shall be provided to the following:

[1] The Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, NJ, 08625-0418.

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

<b>Best Management Practice</b>	<b>TSS Percent Removal Total Rate</b>	<b>Phosphorus Total Nitrogen Percent Removal Rate</b>
Bioretention systems	90	60
Constructed stormwater wetland	90	50
Extended detention basin	40-60 (final rate based upon detention time; see New Jersey BMP Manual, Chapter 9)	20
Infiltration basin	80	60
Manufactured treatment device	Pollutant removal rates as certified by NJDEP; see § 238-8A(2)(i).	Pollutant removal rates as certified by NJDEP; see § 238-8A(2)(i).
Pervious paving systems	80 (porous paving)	60
	80 (permeable pavers with storage bed)	0 - volume reduction only (permeable pavers without storage bed)
	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)
Sand filter	80	50
Vegetative filter strip	60 (turf grass)	30
	70 (native grasses, meadow and planted woods)	30
(For filter strips with multiple vegetated covers, the final TSS removal rate should be based upon a weighted average of the adopted rates shown in Table 2, based upon the relative flow lengths through each cover type.)		
Wet pond / retention basin	50-90 (final rate based upon pool volume and detention time; see NJ BMP Manual)	50

Source: 7:8 — 5.5 (c) and New Jersey BMP Manual Chapter 4.

(6) Nutrient removal rates for stormwater BMPs. For purposes of postdevelopment nutrient load reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. If alternative stormwater BMPs are proposed, the applicant shall demonstrate that the selected BMPs will achieve the nutrient removal standard required in § 238-5G.

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

- (1) In complying with the groundwater recharge requirements in § **238-5G**, the design engineer shall calculate groundwater recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program incorporated herein by reference, as amended and supplemented. Information regarding the methodology is available in § **238-5** or from the New Jersey BMP Manual.
- (2) Alternative groundwater recharge calculation methods to meet these requirements may be used upon approval by the City Engineer.
- (3) In complying with the groundwater recharge requirements in § **238-5**, the design engineer shall:
  - (a) Calculate stormwater runoff volumes in accordance with the USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Runoff Curve Numbers, as described in the NRCS National Engineering Handbook Part 630 — Hydrology and Technical Release 55, Urban Hydrology for Small Watersheds, as amended and supplemented; and
  - (b) Use appropriate two-year, twenty-four-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.
- (4) When calculating groundwater recharge or stormwater runoff for predeveloped site conditions, the design engineer shall use the following criteria:
  - (a) When selecting land covers or calculating runoff curve numbers (CNs) for predeveloped project site conditions, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if:
    - [1] Such land cover has existed at the site or portion thereof without interruption for at least five years immediately prior to the time of application; and
    - [2] The design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records.
  - (b) If more than one land cover, other than woods, has existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations.
  - (c) All predeveloped land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

**238-7 Standards for nonstructural stormwater management measures.**

A. Nonstructural stormwater management strategies incorporated into site design shall:

- (1) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment

loss;

- (2) Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;
  - (3) Maximize the protection of natural drainage features and vegetation;
  - (4) Minimize the decrease in the time of concentration from preconstruction to postconstruction. "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;
  - (5) Minimize land disturbance including clearing and grading;
  - (6) Minimize soil compaction;
  - (7) Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
  - (8) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
  - (9) 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:
    - (a) Site design features that help to prevent accumulation of trash and debris in drainage systems;
    - (b) Site design features that help to prevent discharge of trash and debris from drainage systems;
    - (c) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
    - (d) 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.
  - (10) Blocks and lots shall be graded to secure proper drainage away from all buildings and to prevent the collection of stormwater in pools and to avoid concentration of stormwater from each lot to adjacent lots.
- B. Site design features identified under § 238-6A, or alternative designs in accordance with §238-5H(2), to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids.

- (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; or
  - (b) A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

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.

- (2) 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. Curb-opening inlet grates to be consistent with standardized casting specifications as approved by the City Engineer.
- (3) This standard does not apply:
  - (a) Where each individual clear space in the curb opening in existing curb opening inlet does not have an area of more than nine (9.0) square inches;
  - (b) 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;
  - (c) Where flows from the water quality design storm as specified in § **238-5G(4)(a)** 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:
    - [1] A rectangular space 4 5/8 inches long and 1 1/2 inches wide (this option does not apply for outfall netting facilities); or
    - [2] A bar screen having a bar spacing of 0.5 inches.

Note that these exemptions do not authorize any infringement of requirements in the Residential Site Improvement Standards for bicycle safe grates in new residential development (N.J.A.C. 5:21-4.18(b)2 and 7.4(b)1)

- (d) 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 § 238-5; or

- (e) 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.

#### 238-8 Standards for structural stormwater management measures.

##### A. General design and construction standards.

- (1) Structural stormwater management measures shall be designed to meet the standards established in this section. These standards have been developed to protect public safety, conserve natural features, create an aesthetically pleasing site and promote proper on-site stormwater management.
- (2) The following structural stormwater management measures may be utilized as part of a stormwater management system at a land development, provided that the applicant demonstrates that they are designed, constructed and maintained so as to meet the standards and requirements established by this chapter. If alternative stormwater management measures are proposed, the applicant shall demonstrate that the selected measures will achieve the standards established by this chapter. **[Amended 9-25-2013 by Ord. No. 16-2013]**
  - (a) Bioretention systems: Bioretention systems area designed to aid in the removal of suspended solids, nutrients, metals, hydrocarbons and bacteria from stormwater runoff.
    - [1] The use of bioretention systems should be used as a secondary stormwater management structure. Bioretention systems should be located as close to the area of runoff as possible with runoff entering the system through overland flow. Bioretention systems may be placed in lawns, median strips, parking lot islands, unused lots and certain easements.
    - [2] Bioretention systems must not be placed in operation until the site was been completely stabilized.
    - [3] Bioretention systems should only be used in areas of well draining soils.
  - (b) Constructed stormwater wetlands: Constructed stormwater wetlands are designed to remove suspended solids, nutrients and bacteria from stormwater runoff and provide wildlife habitat.
    - [1] Constructed stormwater wetlands require a minimum drainage area of 10 to 25 acres depending on the type of wetlands.
    - [2] Soils must be poorly draining as to provide permanent pools.
    - [3] Care must be taken to ensure that mosquito breeding does not become a problem.
  - (c) Dry wells: Drywells and porous pipes are designed to infiltrate the runoff from small drainage areas, such as roof structures. These structures supply a means to remove pollutants and provide infiltration

when space is limited.

- [1] Such devices should be used in areas of well draining soils and in cases where there is sufficient separation between the seasonal high-water table and the bottom of the infiltration device.
- (d) Extended detention basins: Extended detention basins provide a means to control stormwater quantity and quality concerns. The lower stages of the basin provide measures to control the stormwater quality storm, while higher stages in the basin can attenuate the peak rates of runoff from larger storms.
  - [1] Such devices are most suitable in cases where there is a significant increase in the amount of runoff. Extended detention basins require a significant amount of room and depth to provide proper performance.
- (e) Vegetated filters: Vegetated filter strips area designed to remove various pollutants such as suspended solids by providing runoff a flow path over a vegetated area. Such areas can be developed in grass-lined waterways or swales and be primarily grass or larger areas may be primarily composed of woods and brush.
  - [1] Grass-lined waterways are a viable option for stormwater conveyance, especially to secondary devices such as infiltration/detention basins. Such areas help promote the life span of basins by removing suspended solids before runoff reaches and settles on basin bottoms.
  - [2] Large vegetated filters such as areas of woods and dense grass may be used alone in small areas of development or in areas where the amount of impervious cover will not be drastically increased.
- (f) Infiltration basins and trenches: Infiltration basins are designed to remove certain pollutants and to infiltrate stormwater. Infiltration basins provide a means to reduce both the peak rate and total volume of runoff caused by land development.
  - [1] Infiltration basins may be used in areas requiring enhanced infiltration of stormwater to meet recharge, quantity and quality requirements set forth by the NJDEP.
  - [2] Such devices should be designed with emergency outfall structures as stated in this code.
- (g) Wet ponds with suitable liners: Wet ponds should be used as landscape devices providing minimal stormwater quantity control. Some quality control can be expected; however, this type of facility should not be your only form of stormwater control.
- (h) Pervious paving systems: Pervious pavements act as infiltration systems providing infiltration either through a pervious paving surface course or through void spaces between individual paving blocks or pavers. Such systems offer enhanced infiltration performance and some pollutant removal.
  - [1] Such devices should not be used in industrial and commercial areas where solvents and/or petroleum products are loaded, unloaded, stored or applied or pesticides are loaded, unloaded, or stored.

- [2] The use of such devices should be limited around building structures where enhanced infiltration could cause basement seepage or flooding.
- [3] Due to reduced shear strength of the surface course, pervious paving surface should be limited to areas of low traffic volumes and weight, such as: secondary aisles in parking lots, single-family driveways, sidewalk and walkways, golf cart paths, and overflow parking areas.
  - (i) Manufactured treatment devices, provided their pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the NJDEP.
- (3) Structural stormwater management measures shall be designed to take into account the existing site conditions, including environmentally critical areas, wetlands, flood-prone areas, slopes, depth to seasonal high-water table, soil type, permeability and texture, and drainage area and drainage patterns.
- (4) Structural stormwater management measures shall be designed and constructed 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, 7.4, and 7.8 shall be deemed to meet this requirement); to minimize and facilitate maintenance and repairs; and to ensure proper functioning.
- (5) For all stormwater management measures at a development site, each applicant shall submit a detailed inspection, maintenance and repair plan consistent with the requirements of § **238-14** of this chapter.
- (6) To the maximum extent practicable, the design engineer shall design structural stormwater management measures on the development site in a manner that:
  - (a) Limits site disturbance, maximizes stormwater management efficiencies, and maintains or improves aesthetic conditions;
  - (b) Utilizes multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, instead of a single larger structural stormwater management measure;
  - (c) Incorporates pretreatment measures. Pretreatment can extend the functional life and increase the pollutant removal capability of a structural stormwater management measure. Pretreatment measures may be designed in accordance with the New Jersey BMP Manual or other sources approved by the City Engineer.
- (7) Stormwater management basins shall be designed in a manner that complements and mimics the existing natural landscape, including but not limited to the following design strategies:
  - (a) Use of natural, nonwetland wooded depressions for stormwater runoff storage; and
  - (b) Establishment of attractive landscaping in and around the basin that mimics the existing vegetation.
- (8) Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning.

- (9) In many instances, the provisions of separate detention facilities for a number of single sites may be more expensive and more difficult to maintain than provisions of joint facilities for a number of sites. In such cases, the City will be willing to consider provisions of joint detention facilities which will fulfill the requirements of this regulation. In such cases, a properly planned staged program of detention facilities may be approved by the City.
- (10) The location of a retention system that is approved in lieu of detention facilities shall be in areas with seasonal high water a minimum of two feet below the lowest elevation of the facility. Where the bottom of any proposed retention basin is less than two feet above impervious soil formations, the use of vertical drains or other methods, subject to the approval of the Engineer, may be employed, provided that the water quality is addressed.
- (11) In establishing the location and constructing basins, every effort shall be made to utilize existing contours and depressions.
- (12) Guidance on the design and construction of structural stormwater management measures may be found in the New Jersey BMP Manual. Other guidance sources may also be used upon approval by the City Engineer.
- (13) After all construction activities and required field testing have been completed on the development site, as-built plans depicting design and as-built elevations of all stormwater management measures shall be prepared by a licensed land surveyor and submitted to the City Engineer in paper and electronic format acceptable to the City Engineer. Based upon the City Engineer's review of the as-built plans, all corrections or remedial actions deemed by the City Engineer to be necessary due to the failure to comply with the standards established by this chapter and/or any reasons of public health or safety shall be completed by the applicant. In lieu of review by the City Engineer, the City of Linwood reserves the right to engage a professional engineer to review the as-built plans. The applicant shall pay all costs associated with such review. Review costs shall be guaranteed through the establishment of an escrow posted by the applicant in accordance with the provisions of the Municipal Land Use Law (N.J.S.A. 40:55D).

B. Standards for detention basins are as follows:

- (1) At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of three inches in diameter.
- (2) Stormwater management basins shall be designed with gently sloping sides. The maximum allowable basin side slope shall be three horizontal to one vertical (3:1).
- (3) Detention facilities must accommodate site runoff in accordance with § 238-5.
- (4) Outlet waters, including that from a design storm with a recurrence interval of 100 years, shall be discharged from the development at such locations and velocities as to not cause additional erosion or cause additional channels beyond the development from those natural or other drainageways available

before development.

- (5) The location of a detention facility shall be in an area with seasonal high water a minimum of 2.0 feet below the lowest invert elevation of the facility.
  - (6) All detention basins must maximize to the extent practicable the distance between basin inflow and outflow. A slope of 1% shall be provided from inlet to outlet.
  - (7) Water-tolerant species of vegetative cover for detention basin usage must be employed. Suggested varieties of cover include reed, canary grass, fescue, perennial rye, orchard grass and Bermuda grass.
  - (8) Outlets from detention facilities shall be designed to function without manual, electric or mechanical controls.
  - (9) If detention basins are provided through which water passes at times other than following rainfall, the City Engineer should be consulted concerning design criteria. It will be necessary for detention requirements to be met, despite the necessity of passing certain low flows. This applies to all online detention basins.
  - (10) A low-flow channel shall be incorporated into the detention basin to prevent broad area ponding.
  - (11) Stabilized access 20 feet wide is to be provided to the detention facility capable of supporting maintenance vehicles.
  - (12) During construction, all basins shall be lined with filter fabric to prevent the siltation of subsurface soils. After completion of the proposed development, the fabric shall be inspected on a regular basis and removed or replaced, if necessary.
  - (13) At inflow points to detention basins, energy dissipaters, designed in accordance with the current Soil Conservation Service standards for soil erosion and sediment control, must be incorporated to reduce the velocity of inflowing waters.
  - (14) The design of the facility should be based upon peak rates of runoff for the entire drainage area upstream from the parcel in question, and the design release rates should be computed on the basis of preexisting conditions for the entire watershed.
  - (15) Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at § 238-12.
- C. Standards for retention/infiltration basins shall incorporate all of the standards listed above for detention basins except for outlet design with the addition of the following:
- (1) A retention basin system must accommodate stormwater runoff so that the minimum rate of percolation of the soil is 15 minutes per inch, which allows infiltration of 36 inches of runoff over a three-day period from the basin.

- (2) The location of a retention facility shall be in an area with seasonal high water a minimum of two feet below the lowest invert elevation of the facility. The bottom of any proposed basin shall be at least five feet above any impervious soil formations found in the soil logs or otherwise the impervious layer shall be penetrated at required intervals.
  - (3) Sediment traps must be located such that all inflowing stormwater is treated before entering any subsurface recharge system.
  - (4) Soil within the recharge system shall be protected with filter fabric during construction; then, when site construction is complete, the filter fabric shall be removed and basin soils stabilized.
  - (5) A low-flow channel shall be incorporated into the retention basin to prevent broad area ponding.
  - (6) Stabilized access 20 feet wide is to be provided to the retention facility capable of supporting maintenance vehicles.
  - (7) The retention of site runoff as required by this chapter will result in the accumulation of sediment, including particulate silt and debris. Provision must be made for periodic removal of accumulated solid materials such that the basin continues to operate as designed.
  - (8) Infiltration practices, such as dry well, infiltration basins, infiltration trenches, buffer strips, etc., may be used to satisfy this requirement, provided that they produce zero runoff from the water quality design storm and allow for complete infiltration within 36 hours.
- D. Standards for detention/infiltration basins in flood hazard areas shall meet or exceed all standards as listed in the above two sections with the additional requirements as listed below:
- (1) Whenever practicable, developments and their stormwater facility basins should be located outside the extent of Zone A5, flood hazard boundary. When this is not possible and facility basins are located partially or wholly within Zone A5 (as defined by New Jersey Division of Water Resources, Bureau of Flood Plain Management), some storm conditions will make the facility ineffective at providing retention of site runoff. This will happen if the stream is already overflowing its banks and the basin, causing the basin to be filled prior to the time it is needed for containment of runoff. In such cases, the standards established in these regulations will be modified in order to give only partial credit to detention capacities located within the A5 Zones. The credit will vary in a ratio intended to reflect the probability that storage will be available at the time a storm occurs at the site.
  - (2) Stormwater runoff storage parameters shall be based upon the location and elevation of said facility. If a facility is located on the edge or within the base flood elevation (A5 Zone), the following criteria shall be used to determine effective storage:
    - (a) When the bottom of the stormwater facility is less than two feet below the base flood elevation, a storage volume of 2 1/2 times the calculated site runoff storage volume must be accommodated by the basin.

- (b) When the bottom of the stormwater facility is between two feet and four feet below base flood elevation, a storage volume of four times the calculated site runoff storage volume must be accommodated by the basin.
- (c) When the bottom of the said facility is four feet or more below the base flood elevation, a storage volume of 10 times the calculated site runoff storage volume must be provided by the basin.
- (3) As an alternative approach to the above criteria, if the developer can demonstrate that the detention provided would be effective, during runoff from the twenty-five-year twenty-four-hour Type III storm, peaking simultaneously at the site and on the flood hazard area, his plan will be accepted as complying with provisions in the above set criteria.
- E. Landscaping. All detention and retention-infiltration basins shall be landscaped in accordance with Chapter 7 of the New Jersey Stormwater Best Management Practices Manual.
- F. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized, provided 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 § 238-4 of this chapter.
- G. Drainage structures and stormwater conveyance systems are required to meet the following standards:
  - (1) All drainage structures, including manholes, inlets, headwalls and sections and box culverts, shall conform to the current details of the New Jersey Department of Transportation. Unless approved otherwise by the Engineer, all curb inlets shall be standard Type B with curb piece heights equal to the exposed curb face of the adjacent curb plus two inches. All lawn inlets shall be standard Type E. When the pipe size is such as to require a larger structure, standard Type B1 or B2, E1 and E2 shall be used. If still larger sizes are required, they shall be specifically detailed using standard frames and grates.
  - (2) Type B street inlets shall have the "J-ECO" casting or approved equal. All street inlets shall be constructed with a bicycle safe grate.
  - (3) Dished gutters on local streets shall be permitted only at T intersections involving local streets. Dished gutters shall not be permitted on arterial or collector streets.
  - (4) Storm drain pipes running longitudinally along streets shall not be located under curbing.
  - (5) Storm drainage pipe shall be concrete unless an alternate is approved. If an alternate is considered, it may be corrugated round, arch or helical. All pipe shall be of the size specified and laid to the exact lines and grades approved. Reinforced concrete pipe shall conform to ASTM Specification C76. All pipe shall be Class 111 strength, except where stronger pipe is required. Joints shall have 0-ring rubber gaskets, where necessary. Steel, aluminum or other pipe shall meet the latest American Association of State Highway and Transportation Officials standard.

- (a) All storm sewer systems shall have a design capacity equal to or greater than the volume of runoff generated by the ten-year twenty-four-hour Type III storm event. The minimum pipe diameter shall be 15 inches. The maximum distances between manholes or inlets shall be 500 feet.
- (b) Pipe crown elevations shall be matched in all manholes and inlets. In general, a cover of one diameter shall be maintained over the drainage pipe. If this is not possible, a higher class pipe must be specified or trench conditions must be designed and detailed to ensure at least eighty-five-percent relative compaction.
- (c) Inlets shall be specified with cast curb piece inlets attached. Inlets shall be depressed one or two inches to increase capacities on steep grades (6% or more).
- (d) The minimum design velocity when flowing 1/4 full shall be at least two feet per second, but no more than 10 feet per second. Pipes shall be considered flowing full at maximum capacity.
- (e) Single Type B inlets shall not be designed to catch more than 5 1/2 cubic feet per second, regardless of head.
- (f) Concrete pipe shall be utilized beneath roadways and parking areas.

**238-9 Mitigation plans.**

- A. Applicants seeking a variance or exemption from the stormwater management design and performance standards stated herein may at the City's discretion; provide off-site mitigation measures subject to the following:
  - (1) The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards defined herein. The developer must ensure the long-term maintenance of the project, including maintenance requirements specified under § **238-14**.
  - (a) The Planning Board may direct an applicant seeking variance or waiver relief to perform all or a portion of the work identified in any mitigation projects to compensate for a deficit from the performance standards resulting from the proposed project. Potential mitigation projects shall be as designated by the City Engineer. [**Amended 4-11-2018 by Ord. No. 6-2018**]
  - (2) If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Subsection **A(1)** above, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the eighty-percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment.
- B. The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in the City's municipal stormwater management plan or towards the development of a regional stormwater management plan. The funding



must be equal to or greater than the cost to implement the mitigation measures, including costs associated with the long-term maintenance requirements of the mitigation measure.

#### **238-10 Soils investigation requirements.**

- A. A minimum of two test pits shall be required for all detention, retention or other stormwater facilities. For all basins with a surface area of 1/2 acre or more, test pits will be required at a rate of one test pit for each 1/2 acre in excess of the initial minimum of two test pits per facility. All test pits must extend at least five feet below the bottom of any proposed detention facility and 10 feet below the bottom of any retention/infiltration facility. Soil boring information shall be displayed on preliminary plans and shall include:
- (1) The soil texture as described in the United States Department of Agriculture Soil Texture Classification System.
  - (2) The soil colors as described in the Munsell Color Chart.
  - (3) The estimated depth of seasonal high groundwater based on mottling characteristics of the soil.
  - (4) The depth of static water level at the time of boring.
  - (5) The vegetation types immediately surrounding the area.
- B. Percolation/permeability tests. At least one percolation or permeability test shall be performed at the site of each basin or disposal area. The percolation/permeability tests shall be performed at a depth corresponding to the approximate bottom of the basin or infiltration facility.
- C. Fill material. Fill material used for stormwater facilities shall have a percolation/permeability rate equal to or greater than the existing soils. All fill material shall meet or exceed the quality of the existing soil. Fill shall be as free of clay soils as possible.

#### **238-11 Sources for technical guidance.**

- A. Technical guidance for stormwater management measures can be found in the documents listed in Subsections **A(1)** and **A(2)** below, which are available to download from the Department's website at:
- [http://www.nj.gov/dep/stormwater/bmp\\_manual2.htm](http://www.nj.gov/dep/stormwater/bmp_manual2.htm)
- (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, but not limited to: 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.

(3) Additional maintenance guidance is available on the Department's website at:

[http://www.njstormwater.org/maintenance\\_guidance.htm](http://www.njstormwater.org/maintenance_guidance.htm)

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

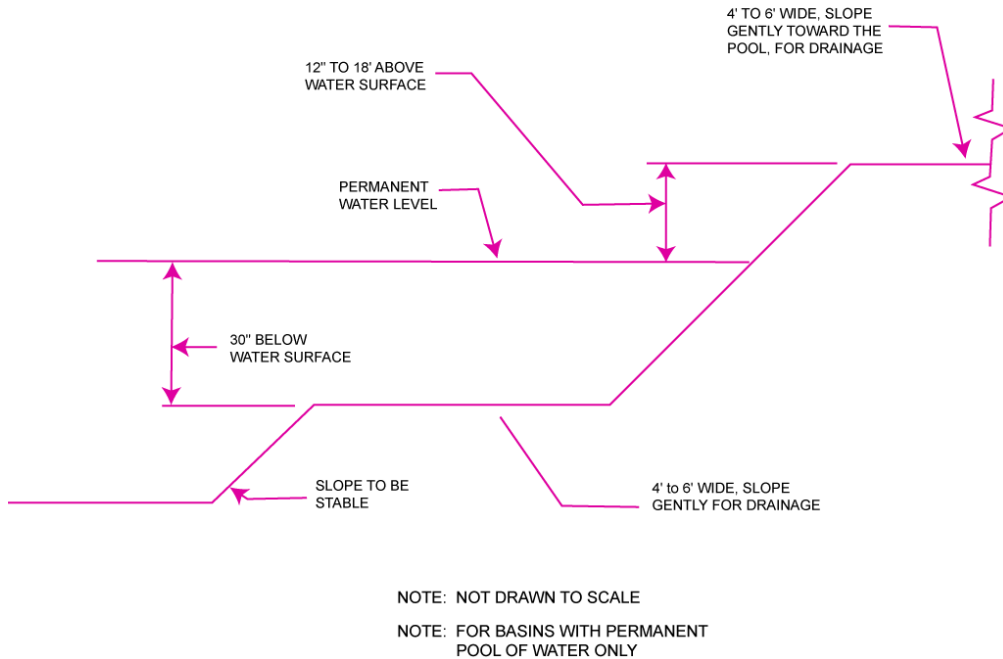
- (1) The Standards for Soil Erosion and Sediment Control in New Jersey, promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the soil conservation districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each soil conservation district may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540;
  - (2) The Rutgers Cooperative Extension Service, (732) 932-9306; and
  - (3) The soil conservation districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each soil conservation district may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.
- C. Submissions required for review by the Department should be mailed to the Division of Water Quality, New Jersey Department of Environmental Protection, Mail Code 401-02B, PO Box 420, Trenton, New Jersey 08625-0420.

#### **238-12 Safety standards for stormwater management BMPs.**

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management BMP. This section applies to any new stormwater management BMP.
- 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 BMP to ensure proper functioning of the BMP 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 square foot.

- (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 square foot.
  - (3) For purposes of this paragraph, 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 BMP shall include escape provisions as follows:
    - (a) If a stormwater management BMP has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in § **238-8C**, 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 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 1 1/2 feet above the permanent water surface. See § **238-8D** 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 3 horizontal to 1 vertical.
- C. Variance or exemption from safety standards.
- (1) 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 (City, 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.



**§ 238-13 Requirements for a site development stormwater plan.**

**A. Submission of site development stormwater plan.**

- (1) Whenever an applicant seeks City approval of a development subject to this chapter, the applicant shall submit all of the required components of the checklist for the site development stormwater plan at § 238-13C below 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 chapter.
- (3) The applicant shall submit the required number of copies of the materials listed in the checklist for site development stormwater plans in accordance with § 238-13C of this chapter.

**B. Site development stormwater plan approval.** The applicant's site development project shall be reviewed as a part of the subdivision or site plan review process by the City board or official from whom City approval is sought. That City board or official shall consult the engineer retained by the Planning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this chapter. **[Amended 4-11-2018 by Ord. No. 6-2018]**

**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 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 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 may also be provided.
- (4) Land use planning and source control plan. This plan shall provide a demonstration of how the goals and standards of §§ **238-3** through **238-6** 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. Comprehensive hydrologic and hydraulic design calculations for the predevelopment and postdevelopment conditions for the design storms specified in § **238-6** of this chapter. When the proposed stormwater management control measures depend on the hydrologic properties of soils or require certain separation from the seasonal high water table, then a soils report shall be submitted. The soils report shall be based on onsite 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 § **238-14**.
- (8) Soil investigation report. Soils report must contain the results from subsurface investigations including test pits and borings along with the results for percolation and permeability. The locations of the tests should be clearly labeled on plans.
- (9) Waiver from submission requirements. The City official or board reviewing an application under this chapter may, in consultation with the City Engineer, waive submission of any of the requirements in § **238-13C(1)** through **C(6)** of this chapter 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.

#### 238-14 **Maintenance and repair.**

- A. Applicability. Projects subject to review as in § **238-1** of this chapter shall comply with the requirements of § **238-14B**.
- B. General maintenance.
  - (1) Responsibility for operation and maintenance of all facilities, including periodic removal and disposal of accumulated particulate material and debris, shall remain with the owner or owners of the property, with permanent arrangements that shall pass to any successive owner, unless assumed by a government agency. If portions of the land are to be sold, legally binding arrangements shall be made to pass the basic responsibility to successors in title. These arrangements shall designate for each project the property owner, governmental agency or other legally established entity to be permanently responsible for maintenance.
    - (a) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a development. [**Amended 9-25-2013 by Ord. No. 16-2013**]
    - (b) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal, manpower, capital cost of equipment, repair costs; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). This plan shall contain information on BMP location, design, ownership, maintenance tasks and frequencies, and other details as specified in Chapter 9 of the NJ BMP Manual, as well as the tasks specific to the type of BMP, as described in the applicable chapter containing design specifics. 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.

- (c) 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. The individual property owner may be assigned incidental tasks, such as weeding of a green infrastructure BMP, provided the individual agrees to assume these tasks; however, the individual cannot be legally responsible for all of the maintenance required.
- (d) If the person responsible for maintenance identified under § **238-14B(1)** above is not a public agency, the maintenance plan and any future revisions shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
- (e) 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.
- (f) The person responsible for maintenance identified under § **238-14B(1)** 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.
- (g) The person responsible for maintenance identified under § **238-14B(1)** above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.
- (h) The person responsible for maintenance identified under § **238-14B(1)** 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 this section.
- (i) The requirements of § **238-14B(1)(f)**, **238-14B(1)(g)** and **238-14B(1)(h)** do not apply to stormwater management facilities that are dedicated to and accepted by the City or another governmental agency, subject to all applicable municipal stormwater general permit conditions, as issued by the Department.
- (j) 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 City 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 City Engineer or his designee. The City, 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 City may immediately proceed to do so and shall bill the cost thereof to the responsible person. Nonpayment of such bill may result in a lien on the property.
- (k) Prior to the granting of any site development approval, the applicant shall enter into an agreement

(declaration of covenants and restrictions for drainage structures) with the City to insure the continued operation and maintenance of the stormwater facility unless the City has consented to accept the facility as City property. This agreement shall be in a form satisfactory to the City Attorney and may include, but may not necessarily be limited to, personal guarantees, deed restrictions, covenants and bonds. In cases where the property is subdivided and sold separately, a homeowners' association or similar permanent entity shall be established as the responsible entity, absent an agreement by a governmental agency to assume responsibility. The agreement shall also provide for regular inspection at the expense of the applicant, or the applicant's successors in interest, and for the undertaking by the applicant and successors of such corrective measures as are shown by such inspection to be required for the proper functioning of the facilities. The agreement shall provide, among other things, that the applicant shall provide up to a four-year maintenance guaranty for the entire stormwater management system, which shall commence at the conclusion of the period required for such performance guaranty as required by the Board. The agreement shall also provide for an inspection and maintenance program of up to 10 years in duration.

- (l) The applicant must obtain approval from the Engineer for all arrangements and values described in Subsection **B(1)(b)**.
- (m) The applicant must deliver an easement for a clear accessway of 20 feet to all stormwater facilities for the purpose of assuring vehicular access for maintenance activities.
- (2) Nothing in this section shall preclude the City from requiring the posting of a performance and/or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

**238-15 As-built certification.**

- A. When excavated and completed, the design engineer shall certify in writing to the City that the stormwater facility will operate as intended in the design phase, taking into consideration all soil and water conditions encountered during construction. As-built percolation test results shall also be provided if the basin has been used as a place for sediment accumulation during the construction process.
- B. Both retention and detention basins shall have the following improvements as further specified in the New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction, as amended, and New Jersey Department of Transportation Standard Construction Details, as amended:
  - (1) Headwalls and riprap.
  - (2) A chain link fence, four feet high, around the entire perimeter may be required by the Planning Board. In cases where a fence is required, a twelve-foot opening shall be provided for vehicular access to streets by means of a fifteen-foot-wide access right-of-way. The fence shall not extend into the building front yard setback area.
  - (3) An eighteen-inch berm around the inside of the basin.
  - (4) Landscaping is required around the entire perimeter, except where it faces planned open spaces or



wooded areas or other natural or man-made visual separation existing between the facility and adjoining lands.

**238-16 Violations and penalties.**

Any person(s) who continues to be in violation of the provisions of this article, after being duly notified, shall be subject to a fine not to exceed \$5,000 plus costs of remediation.

**238-17 Effective date.**

This chapter 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.

**238-18 Severability.**

If the provisions of any section, subsection, paragraph, subdivision, or clause of this chapter 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 chapter.

## **Article II Improper Disposal of Waste**

**238-19 Purpose.**

The purpose of this article is to prohibit the spilling, dumping or disposal of materials other than stormwater to the municipal separate storm sewer system (MS4) operated by the City of Linwood so as to protect public health, safety and welfare and to prescribe penalties for the failure to comply.

**238-20 Definitions.**

For the purpose of this article, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this article clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.

### **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)**

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) that is owned or operated by the City of Linwood or other public body and is designed and used for collecting and conveying stormwater.

### **PERSON**

Any individual, corporation, company, partnership, firm, association or political subdivision of this state subject to municipal jurisdiction.

### **STORMWATER**

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

**238-21 Prohibited conduct.**

The spilling, dumping or disposal of materials other than stormwater to the municipal separate storm sewer

system operated by the City of Linwood is prohibited. The spilling, dumping or disposal of materials other than stormwater in such a manner as to cause the discharge of pollutants to the municipal separate storm sewer system is also prohibited.

**238-22 Exceptions to prohibition.**

- A. Waterline flushing and discharges from potable water sources.
- B. Uncontaminated groundwater (e.g., infiltration, crawl space or basement sump pumps, foundation or footing drains, rising groundwaters).
- C. Air-conditioning condensate (excluding contact and noncontact cooling water).
- D. Irrigation water (including landscape and lawn watering runoff).
- E. Flows from springs, riparian habitats and wetlands, water reservoir discharges and diverted steam flows.
- F. Residential car washing water and residential swimming pool discharges.
- G. Sidewalk, driveway and street wash water.
- H. Flows from fire-fighting activities.
- I. Flows from rinsing of the following equipment with clean water:
  - (1) Beach maintenance equipment immediately following their use for their intended purposes; and
  - (2) Equipment used in the application of salt and deicing materials immediately following salt and deicing material applications. Prior to rinsing with clean water, all residual salt and deicing materials must be removed from equipment and vehicles to the maximum extent practicable using dry cleaning methods (e.g., shoveling and sweeping). Recovered materials are to be returned to storage for reuse or properly discarded. Rinsing of equipment, as noted in the above situation, is limited to exterior, undercarriage and exposed parts and does not apply to engines or other enclosed machinery.

**238-23 Enforcement.**

This article shall be enforced by the Police Department of the City of Linwood.

**238-24 Violations and penalties.**

Any person(s) who continues to be in violation of the provisions of this article, after being duly notified, shall be subject to a fine not to exceed \$5,000 plus costs of remediation.

**Article III Illicit Connection**

**238-25 Purpose.**

The purpose of this article is to prohibit illicit connections to the municipal separate storm sewer system(s) operated by the City of Linwood so as to protect public health, safety and welfare and to prescribe penalties for the failure to comply.

## **238-26 Definitions.**

For the purpose of this article, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this article clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory. The definitions below are the same as or based on corresponding definitions in the New Jersey Pollutant Discharge Elimination System (NJPDES) rules at N.J.A.C. 7:14A-1.2.

### **DOMESTIC SEWAGE**

Waste and wastewater from humans or household operations.

### **ILLICIT CONNECTION**

Any physical or nonphysical connection that discharges domestic sewage, noncontact cooling water, process wastewater or other industrial waste (other than stormwater) to the municipal separate storm sewer system operated by the City of Linwood, unless that discharge is authorized under a NJPDES permit other than the Tier A Municipal Stormwater General Permit (NJPDES Permit Number NJ0141852). Nonphysical connections may include, but are not limited to, leaks, flows or overflows into the municipal separate storm sewer system.

### **INDUSTRIAL WASTE**

Nondomestic waste, including but not limited to those pollutants regulated under Section 307(a), (b) or (c) of the Federal Clean Water Act [33 U.S.C. § 1317(a), (b) or (c)].

### **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)**

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) that is owned or operated by the City of Linwood or other public body and is designed and used for collecting and conveying stormwater.

### **NJPDES PERMIT**

A permit issued by the New Jersey Department of Environmental Protection to implement the New Jersey Pollutant Discharge Elimination System (NJPDES) rules at N.J.A.C. 7:14A.

### **NONCONTRACT COOLING WATER**

Water used to reduce temperature for the purpose of cooling. Such waters do not come into direct contact with any raw material, intermediate product (other than heat) or finished product. Noncontact cooling water may, however, contain algaecides or biocides to control fouling of equipment such as heat exchangers and/or corrosion inhibitors.

### **PERSON**

Any individual, corporation, company, partnership, firm, association or political subdivision of this state subject to municipal jurisdiction.

## **PROCESS WASTEWATER**

Any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product or waste product. Process wastewater includes, but is not limited to, leachate and cooling water other than noncontact cooling water.

## **STORMWATER**

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

### **238-27 Prohibited conduct.**

No person shall discharge or cause to be discharged through an illicit connection to the municipal separate storm sewer system operated by the City of Linwood any domestic sewage, noncontact cooling water, process wastewater or other industrial waste (other than stormwater).

### **238-28 Enforcement.**

This article shall be enforced by the Police Department of the City of Linwood.

### **238-29 Violations and penalties.**

Any person(s) who is found to be in violation of the provisions of this article shall be subject to a fine not to exceed \$5,000 plus costs of remediation.

## **Article IV Private Storm Drain Inlet Retrofitting**

**[Added 2-24-2010 by Ord. No. 2-2010]**

### **238-30 Purpose.**

The purpose of this article is to require the retrofitting of existing storm drain inlets which are in direct contact with repaving, repairing, reconstruction, resurfacing or alterations of facilities on private property, to prevent the discharge of solids and floatables (such as plastic bottles, cans, food wrappers and other litter) to the municipal separate storm sewer system(s) operated by the City of Linwood so as to protect public health, safety and welfare, and to prescribe penalties for the failure to comply.

### **238-31 Definitions.**

For the purpose of this article, the following terms, phrases, words, and their derivations shall have the meanings stated herein unless their use in the text of this article clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.

## **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)**

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by the City of Linwood or other public body, and is designed and used for collecting and conveying stormwater.

## **PERSON**

Any individual, corporation, company, partnership, firm, association, or political subdivision of this state subject to municipal jurisdiction.

### **STORM DRAIN INLET**

An opening in a storm drain used to collect stormwater runoff and includes, but is not limited to, a grate inlet, curb-opening inlet, slotted inlet, and combination inlet.

### **WATERS OF THE STATE**

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

#### **238-32 Prohibited conduct.**

No person in control of private property (except a residential lot with one single-family house) shall authorize the repaving, repairing (excluding the repair of individual potholes), resurfacing (including top coating or chip sealing with asphalt emulsion or a thin base of hot bitumen), reconstructing or altering of any surface that is in direct contact with an existing storm drain inlet on that property unless the storm drain inlet either:

- A. Already meets the design standard below to control passage of solid and floatable materials; or
- B. Is retrofitted or replaced to meet the standard in § **238-33** prior to the completion of the project.

#### **238-33 Design standard.**

Storm drain inlets identified in § **238-32** shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this section, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended or settleable solids. For exemptions to this standard, see Subsection 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 not 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 does not apply:
- (1) Where the municipal engineer agrees 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 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; or
  - (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.

**238-34 Application for permit; fee.**

- A. Whenever any person in control of private property (except a residential lot with one single-family house) desires to repave, repair (excluding the repair of individual potholes), resurface (including top coating or chip sealing with asphalt emulsion or a thin base of hot bitumen), reconstruct or alter any surface, application by the owner or owner's contractor shall be made to the Zoning Officer. The Zoning Officer or his designee shall examine said application and upon approval shall grant a permit to the applicant. Fees for the aforesaid permit shall be \$25 each.
- B. Whenever an applicant believes that his private property or any storm drain inlet on his property should be excluded in accordance with § **238-33C**, he shall provide a written justification with his application stating the reasons why. When an applicant believes that he is exempt under the § **238-33C(1)**, he shall provide the necessary hydraulic calculation as prepared a professional engineer, licensed in the State of New Jersey.
- C. An inspection fee deposit for retrofitting of storm drain inlets shall be paid by the applicant to the City Clerk. The amount of the deposit shall be calculated as follows:
- (1) Verification by Municipal Engineer that subject private property does not have any existing storm drain

inlets: \$100.

- (2) Verification by Municipal Engineer that existing storm drain inlets already meet the design standard of this article: \$100 for the first four storm drain inlets, plus an additional \$20 per each additional storm drain inlet over four. A minimum of \$100 shall be paid.
- (3) Verification by Municipal Engineer that existing storm drain inlets have been retrofitted to meet the design standard of this article: \$100 for the first four storm drain inlets, plus an additional \$20 per each additional storm drain inlet over four. A minimum of \$100 shall be paid.

#### **238-35 Enforcement.**

**[Amended 9-25-2013 by Ord. No. 16-2013]**

This article shall be enforced by the City Construction Official, City Engineer, Zoning Officer, and/or City Code Enforcement Officer in conjunction with the City of Linwood Police Department.

#### **238-36 Violations and penalties.**

Any person(s) who is found to be in violation of the provisions of this article shall be subject to a fine of \$250 for each storm drain inlet that is not retrofitted to meet the design standard and/or \$250 for failure to make application for any appropriate permit. This fine shall not relieve the person(s) found in violation of the requirement to obtain any necessary permit and/or the requirement to retrofit each storm drain inlet.

### **Article V Refuse Containers; Dumpsters**

**[Added 2-24-2010 by Ord. No. 2-2010]**

#### **238-37 Purpose.**

The purpose of this article is to require dumpsters and other refuse containers that are outdoors or exposed to stormwater to be covered at all times and prohibits the spilling, dumping, leaking, or otherwise discharge of liquids, semi-liquids or solids from the containers to the municipal separate storm sewer system(s) operated by the City of Linwood and/or the waters of the state so as to protect public health, safety and welfare, and to prescribe penalties for the failure to comply.

#### **238-38 Definitions.**

For the purpose of this article, the following terms, phrases, words, and their derivations shall have the meanings stated herein unless their use in the text of this article clearly demonstrates a different meaning. When not consistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words in the singular number include the plural number. The word "shall" is always mandatory and not merely directory.

#### **MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)**

A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) that is owned or operated by the City of Linwood or other public body, and is designed and used for collecting and conveying stormwater.

#### **PERSON**

Any individual, corporation, company, partnership, firm, association, or political subdivision of this state subject to municipal jurisdiction.

### **REFUSE CONTAINER**

Any waste container that a person controls, whether owned, leased, or operated, including dumpsters, trash cans, garbage pails, and plastic trash bags.

### **STORMWATER**

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

### **WATERS OF THE STATE**

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

#### **238-39 Covering of containers; prevention of leaks and discharges.**

- A. Any person who controls, whether owned, leased, or operated, a refuse container or dumpster must ensure that such container or dumpster is covered at all times and shall prevent refuse from spilling out or overflowing.
- B. Any person who owns, leases or otherwise uses a refuse container or dumpster must ensure that such container or dumpster does not leak or otherwise discharge liquids, semi-liquids or solids to the municipal separate storm sewer system(s) operated by the City of Linwood.

#### **238-40 Exceptions.**

Exceptions are as follows:

- A. Permitted temporary demolition containers.
- B. Litter receptacles (other than dumpsters or other bulk containers).
- C. Individual homeowner trash and recycling containers.
- D. Refuse containers at facilities authorized to discharge stormwater associated with industrial activity under a valid NJPDES permit.
- E. Large bulky items (e.g., furniture, bound carpet and padding, white goods placed curbside for pickup).

#### **238-41 Enforcement.**

This article shall be enforced by the City Construction Official and/or City Code Enforcement Office in conjunction with the City of Linwood Police Department.

#### **238-42 Violations and penalties.**

Any person(s) who is found to be in violation of the provisions of this article shall be subject to a fine of \$1,000 for each refuse container and/or dumpster found in violation. This fine shall not relieve the person(s)



found in violation of the requirement to correct the violation. Any person(s) found to be in violation of this article shall also be responsible for all remedial actions to correct any damage to the MS4 system and/or any public water body caused by a refuse container and/or dumpster that was found to be leaking.

SECTION 2: All ordinances or parts of ordinances inconsistent herewith are hereby repealed to the extent of such inconsistencies.

SECTION 3: Should any sentence, clause, sentence, phrase or provision of this ordinance be declared unconstitutional or invalid by a Court of competent jurisdiction, such decision shall not affect the remaining portions of this ordinance.

SECTION 4: This ordinance shall take effect upon its final passage, publication and adoption in the manner prescribed by law.

<i>FIRST READING:</i>	<i>March 10, 2021</i>
<i>PUBLICATION:</i>	<i>March 15, 2021</i>
<i>PASSAGE:</i>	<i>March 24, 2021</i>

The within Ordinance was introduced at a meeting of the Common Council of the City of Linwood, County of Atlantic and State of New Jersey held on, March 10, 2021 and will be further considered for final passage after a public hearing thereon at a meeting of said Common Council on March 24, 2021.

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LEIGH ANN NAPOLI, RMC, MUNICIPAL CLERK

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DARREN MATIK, MAYOR