CRANBURY TOWNSHIP
ORDINANCE# 06-21-09

AN ORDINANCE OF THE TOWNSHIP OF CRANBURY, MIDDLESEX COUNTY, NEW JERSEY, AMENDING AND REVISING CHAPTER 150-61 (STORMWATER MANAGEMENT) OF THE LAND DEVELOPMENT CODE IMPLEMENTING CHANGES REQUIRED BY THE MIDDLESEX COUNTY OFFICE OF PLANNING AND ENSURING CONSISTENCY WITH THE TOWNSHIP'S SUMP PUMP REGULATIONS IN CHAPTER 132 OF THE TOWNSHIP CODE

WHEREAS, the State of New Jersey adopted amendments to the stormwater management rules at N.J.A.C. 7:8 on March 2, 2020; and

WHEREAS, each municipality in New Jersey is required to adopt a revised stormwater management ordinance to ensure compliance with the NJDEP Stormwater Management Rules; and

WHEREAS, on December 14, 2020, the Township Committee adopted Ordinance # 11-20-12 to implement the new rules; and

WHEREAS, pursuant to N.J.A.C. 7:8-4.4(c), Ordinance # 11-20-12 was sent to the Middlesex County Office of Planning for review, and to approve, conditionally approve, or disapprove of the ordinance; and

WHEREAS, the Middlesex County Office of Planning conditionally approved Ordinance # 11-20-12 and indicated that certain amendments must be made to conform with the requirements of the NJDEP Stormwater Management Rules; and

WHEREAS, in addition to the amendments required by the Middlesex County Office of Planning, certain amendments must be made to Section 160-61(L) to ensure consistency with the Township's revised sump pump discharge regulations in Chapter 132 of the Township Code; and

WHEREAS, the Township Committee desires to amend Ordinance # 11-20-12, codified at Chapter 150-61 of the Township Code, to be in compliance with the NJDEP Stormwater Management Rules and to be consistent with the Township's sump pump discharge regulations.

NOW THEREFORE, BE IT ORDAINED by the Township Committee of the Township of Cranbury, as follows:

Section 1. Section 150-61 of the Code of the Township of Cranbury, entitled "Stormwater Management" shall be amended as follows (deletions are struck through and additions are underlined):

§ 150-61 Stormwater Management.

A. Scope and Purpose

(1) Policy Statement

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.

(2) Purpose

The purpose of this ordinance is to establish minimum stormwater management requirements and controls for "major development," as defined below in Section B.

(3) Applicability

(a) This ordinance shall be applicable to the following major developments:

[1] Non-residential major developments; and

[2] Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

(b) This ordinance shall also be applicable to all major developments undertaken by the Township of Cranbury.

(4) Compatibility with Other Permit and Ordinance Requirements

Development approvals issued pursuant to this ordinance are to be considered an integral part of development approvals 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 ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

This ordinance 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 ordinance 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.

B. Definitions

For the purpose of this ordinance, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this Chapter 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 the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2

"Community basin" means 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" means the increase in soil bulk density.

"Contributory drainage area" means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

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

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

1. A county planning agency; or

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

"Department" means the Department of Environmental Protection.

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

"Design engineer" means 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" means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlarge-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, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 *et seq*.

In the case of development of agricultural land, development means: any activity that requires a State permit, any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC), and municipal review of any activity not exempted by the Right to Farm Act , N.J.S.A 4:1C-1 et seq.

"Disturbance" means 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" means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

"Environmentally constrained area" means 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 area" means an area or feature which is of significant environmental value, including but not limited to: stream corridors, natural heritage priority sites, habitats of endangered or threatened species, large areas of contiguous open space or upland forest, steep slopes, and well head 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.

“Empowerment Neighborhoods” means neighborhoods designated by the Urban Coordinating Council “in consultation and conjunction with” the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

“Erosion” means the detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

“Green infrastructure” means 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" means 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” means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water. Impervious surfaces include, but are not limited to, roofs, asphalt, concrete, compacted gravel & stone, sidewalks, porous asphalt or concrete, decks and patios.

“Infiltration” is the process by which water seeps into the soil from precipitation.

“Lead planning agency” means one or more public entities having stormwater management planning authority designated by the regional stormwater management planning committee pursuant to N.J.A.C. 7:8-3.2, that serves as the primary representative of the committee.

“Major development” means 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); or
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 and redevelopments 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" means 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" means 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.

"Municipality" means any city, borough, town, township, or village.

"New Jersey Stormwater Best Management Practices (BMP) Manual" or "BMP Manual" means 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 D(7) 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" means an area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

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

"Person" means any individual, corporation, company, partnership, firm, association, political subdivision of this State and any state, interstate or Federal agency.

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

"Recharge" means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Redevelopment" means an activity that results in the creation, addition, or replacement of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure or a portion of a structure regardless of footprint; and replacement of impervious surface area that is not part of a routine maintenance activity.

> All new impervious cover, whether created by adding to or replacing impervious cover that was in existence before the development occurs, shall be considered in calculating the requirements for stormwater management. However, any such new impervious cover that will drain into an existing stormwater best management practice that is to remain after the redevelopment and that meets current stormwater management requirements shall be deducted from the total amount of impervious surface that must be treated by new stormwater best management practices. In the case of a redevelopment project, the pre-developed land cover shall be considered to be wooded in good condition.

"Regulated impervious surface" means 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" means 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" means 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" means the lot or lots upon which a major development is to occur or has occurred.

"Soil" means all unconsolidated mineral and organic material of any origin.

"State Plan Policy Map" is defined as 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" means 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" means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management BMP may either be normally dry (that is, a detention basin or infiltration system), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

"Stormwater management measure" means any 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 non-stormwater discharges into stormwater conveyances.

"Stormwater runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

"Stormwater management planning agency" means a public body authorized by legislation to prepare stormwater management plans.

"Stormwater management planning area" means 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.

"Water control structure" means 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" means 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" or "wetland" means an area that is inundated or saturated by surface water or ground water 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.

C. Design and Performance Standards for Stormwater Management Measures

(1) Stormwater management measures for major development shall be designed to provide erosion control, groundwater recharge, stormwater runoff quantity control, and stormwater runoff quality treatment as follows:

(a) The minimum standards for erosion control are those established under the Soil and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules at N.J.A.C. 2:90.

(b) The minimum standards for groundwater recharge, stormwater quality, and stormwater runoff quantity shall be met by incorporating green infrastructure.

(2) The standards in this ordinance apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or Water Quality Management Plan adopted in accordance with Department rules.

D. Stormwater Management Requirements for Major Development

(1) The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with Section J.

(2) 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 muhlnebergi* (bog turtle).

(3) The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section D (17), (18) and (19):

(a) The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;

(b) The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and

(c) 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.

(4) A waiver from strict compliance from the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section D (16), (17), (18) and (19) 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:

(a) The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;

(b) The applicant demonstrates through an alternatives analysis, that through the use of stormwater management measures, the option selected complies with the requirements of Section D (16), (17), (18) and (19) to the maximum extent practicable;

(c) The applicant demonstrates that, in order to meet the requirements of Section D (16), (17), (18) and (19), existing structures currently in use, such as homes and buildings, would need to be condemned; and

(d) 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 Section D(3)(c) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Section D (16), (17), (18) and (19) that were not achievable onsite.

(5) Nonstructural stormwater management strategies.

(a) To the maximum extent practicable, the standards in Section D (6), (17), (18) and (19) of this ordinance shall be met by incorporating nonstructural stormwater management strategies set forth at Section D(5) of this ordinance 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 Section D(5)(b) below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

(b) 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 post-construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;
[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, as follows:

(6) Tables 1 through 3 below summarize the ability of stormwater best management practices identified and described in the New Jersey Stormwater Best Management Practices Manual to satisfy the green infrastructure, groundwater

recharge, stormwater runoff quality and stormwater runoff quantity standards specified in Section D (16), (17), (18) and (19). 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: https://njstormwater.org/bmp_manual2.htm.

(7) 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.

Table 1
Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity

Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Cistern	0	Yes	No	--
Dry Well[(a)]	0	No	Yes	2
Grass Swale	50 or less	No	No	2[(e)] 1[(f)]
Green Roof	0	Yes	No	--
Manufactured Treatment Device[(a) (g)]	50 or 80	No	No	Dependent upon the device

Pervious Paving System[a]	80	Yes	Yes[b] No[c]	2[b] 1[c]
Small-Scale Bioretention Basin[a]	80 or 90	Yes	Yes[b] No[c]	2[b] 1[c]
Small-Scale Infiltration Basin[a]	80	Yes	Yes	2
Small-Scale Sand Filter	80	Yes	Yes	2
Vegetative Filter Strip	60-80	No	No	--

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)

Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Bioretention System	80 or 90	Yes	Yes[b] No[c]	2[b] 1[c]
Infiltration Basin	80	Yes	Yes	2
Sand Filter[b]	80	Yes	Yes	2
Standard Constructed Wetland	90	Yes	No	N/A
Wet Pond[d]	50-90	Yes	No	N/A

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				
Best Management Practice	**Stormwater Runoff Quality TSS Removal Rate (percent)**	**Stormwater Runoff Quantity**	**Groundwater Recharge**	**Minimum Separation from Seasonal High Water Table (feet)**
Blue Roof	0	Yes	No	N/A
Extended Detention Basin	40-60	Yes	No	1
Manufactured Treatment Device[(h)]	50 or 80	No	No	Dependent upon the device
Sand Filter[(c)]	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 Section D(17)(b);
(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 Section B;
(h) manufactured treatment devices that do not meet the definition of green infrastructure at Section B.

(8) 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 stormwater management measure and/or the validity of the 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 in accordance with Section F(2). Alternative stormwater management measures may be used to satisfy the requirements at Section D(16) only if the measures meet the definition of green infrastructure at Section B. Alternative stormwater management measures that function in a similar manner to a BMP listed at Section D(16)(b) are subject to the contributory drainage area limitation specified at Section D(16)(b) for that similarly functioning BMP. Alternative stormwater management measures approved in accordance with this subsection that do not function in a similar manner to any BMP listed at Section D(16)(b) shall have a 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 Section D(4) is granted from Section D(16).

(9) Whenever the stormwater management design includes one or more BMPs that will infiltrate stormwater into subsoil, 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 or other subsurface structures within the zone of influence of the groundwater mound, or interference with the proper functioning of the stormwater management measure itself.

(10) Design standards for stormwater management measures are as follows:

(a) Stormwater management measures shall be designed to take into account the existing site conditions, including, but not limited to, environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability, and texture; drainage area and drainage patterns;

(b) Stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure, as appropriate, and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than one-third the width of the diameter of the orifice or one-third the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches.

In addition, the design of trash racks must comply with the requirements of Section H(3);

(c) Stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement;

(d) Stormwater management BMPs shall be designed to meet the minimum safety standards for stormwater management BMPs at Section H; and

(e) The size of the orifice at the intake to the outlet from the stormwater management BMP shall be a minimum of two and one-half inches in diameter.

(11) Manufactured treatment devices may be used to meet the requirements of this subchapter, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department. Manufactured treatment devices that do not meet the definition of green infrastructure at Section B may be used only under the circumstances described at Section D(16)(d).

(12) Any application for a new agricultural development that meets the definition of major development at Section II shall be submitted to the Soil Conservation District for review and approval in accordance with the requirements at Sections D. (16), (17), (18) and (19) and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For purposes of this subsection, "agricultural development" means land uses normally associated with the production of food, fiber, and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacture of agriculturally related products.

(13) If there is more than one drainage area, the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section D (17), (18) and (19) shall be met in each drainage area, unless the runoff from the drainage areas converge onsite and no adverse environmental impact would occur as a result of compliance with any one or more of the individual standards being determined utilizing a weighted average of the results achieved for that individual standard across the affected drainage areas.

(14) Any stormwater management measure authorized under the municipal stormwater management plan or ordinance shall be reflected in a deed notice recorded in the Office of the Middlesex County Clerk.

A form of deed notice shall be submitted to the municipality for approval prior to filing. The deed notice shall contain a description of the stormwater management measure(s) used to meet the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section D(16), (17), (18) and (19) and shall identify the location of the stormwater management measure(s) in NAD 1983 State Plane New Jersey FIPS 2900 US Feet or Latitude and Longitude in decimal degrees. The deed notice shall also reference the maintenance plan required to be recorded upon the deed pursuant to Section J(2)(e). Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality. Proof that the required information has been recorded on the deed shall be in the form of either a copy of the complete recorded document or a receipt from the clerk or other proof of recordation provided by the recording office. However, if the initial proof provided to the municipality is not a copy of the complete recorded document, a copy of the complete recorded document shall be provided to the municipality within 180 calendar days of the authorization granted by the municipality.

(15) A stormwater management measure approved under the municipal stormwater management plan or ordinance may be altered or replaced with the approval of the municipality, if the municipality determines that the proposed alteration or replacement meets the design and performance standards pursuant to Section D of this ordinance and provides the same level of stormwater management as the previously approved stormwater management measure that is being altered or replaced. If an alteration or replacement is approved, a revised deed notice shall be submitted to the municipality for approval and subsequently recorded with the Office of the Middlesex County Clerk and shall contain a description and location of the stormwater management measure, as well as reference to the maintenance plan, in accordance with Section D(14) above. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality in accordance with Section D(14) above.

(16) Green Infrastructure Standards

(a) 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.

(b) To satisfy the groundwater recharge and stormwater runoff quality standards at Section D(17) and (18), the design engineer shall utilize green infrastructure BMPs identified in Table 1 at Section D(7). and/or an alternative stormwater management measure approved in accordance with Section D(8). The following green infrastructure BMPs are subject to the following maximum contributory drainage area limitations:

Best Management Practice	Maximum Contributory Drainage Area
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

(c) To satisfy the stormwater runoff quantity standards at Section D(19), the design engineer shall utilize BMPs from Table 1 or from Table 2 and/or an alternative stormwater management measure approved in accordance with Section D(8).

(d) If a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with Section D(4) 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 Section D(8) may be used to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at Section D(17), (18) and (19).

(e) 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 Section D(17), (18) and (19), unless the project is granted a waiver from strict compliance in accordance with Section D(4).

(17) Groundwater Recharge Standards

(a) This subsection contains the minimum design and performance standards for groundwater recharge as follows:

(b) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section E, either:

[1] Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or

[2] Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the 2-year storm is infiltrated.

[3] This groundwater recharge requirement does not apply to projects subject to (c) below.

(c) 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, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

(18) Stormwater Runoff Quality Standards

(a) This subsection contains the minimum design and performance standards to control stormwater runoff quality impacts of major development. Stormwater runoff quality standards are applicable when the major development results in an increase of one-quarter acre or more of impervious cover including regulated motor vehicle surface and other at grade surfaces. Stormwater runoff quality standards are not applicable to roofs or canopies.

(b) Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm as follows:

[1] Eighty percent (80%) TSS removal of the anticipated load, expressed as an annual average shall be achieved for the stormwater runoff from the net increase of motor vehicle surface and other at grade impervious surfaces.

[2] If the surface is considered regulated motor vehicle surface or an at grade impervious surface because the water quality treatment for that surface is currently receiving water quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant is to be modified or removed, the project shall maintain or increase the existing TSS removal of the anticipated load expressed as an annual average.

(c) 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 Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. Every major development, including any that discharge into a combined sewer system, shall comply with 2 above, unless the major development is itself subject to a NJPDES permit with a numeric effluent limitation for TSS or the NJPDES permit to which the major development is subject exempts the development from a numeric effluent limitation for TSS.

(d) The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 4, below. The calculation of the volume of runoff may take into account the implementation of stormwater management measures.

Table 4 – Water Quality Design Storm Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
1	0.00166	41	0.1728	81	1.0906
2	0.00332	42	0.1796	82	1.0972
3	0.00498	43	0.1864	83	1.1038
4	0.00664	44	0.1932	84	1.1104
5	0.00830	45	0.2000	85	1.1170
6	0.00996	46	0.2117	86	1.1236
7	0.01162	47	0.2233	87	1.1302
8	0.01328	48	0.2350	88	1.1368
9	0.01494	49	0.2466	89	1.1434
10	0.01660	50	0.2583	90	1.1500
11	0.01828	51	0.2783	91	1.1550
12	0.01996	52	0.2983	92	1.1600
13	0.02164	53	0.3183	93	1.1650
14	0.02332	54	0.3383	94	1.1700
15	0.02500	55	0.3583	95	1.1750
16	0.03000	56	0.4116	96	1.1800
17	0.03500	57	0.4650	97	1.1850
18	0.04000	58	0.5183	98	1.1900
19	0.04500	59	0.5717	99	1.1950
20	0.05000	60	0.6250	100	1.2000
21	0.05500	61	0.6783	101	1.2050
22	0.06000	62	0.7317	102	1.2100
23	0.06500	63	0.7850	103	1.2150
24	0.07000	64	0.8384	104	1.2200
25	0.07500	65	0.8917	105	1.2250
26	0.08000	66	0.9117	106	1.2267
27	0.08500	67	0.9317	107	1.2284
28	0.09000	68	0.9517	108	1.2300
29	0.09500	69	0.9717	109	1.2317
30	0.10000	70	0.9917	110	1.2334
31	0.10660	71	1.0034	111	1.2351
32	0.11320	72	1.0150	112	1.2367
33	0.11980	73	1.0267	113	1.2384
34	0.12640	74	1.0383	114	1.2400
35	0.13300	75	1.0500	115	1.2417
36	0.13960	76	1.0568	116	1.2434
37	0.14620	77	1.0636	117	1.2450
38	0.15280	78	1.0704	118	1.2467
39	0.15940	79	1.0772	119	1.2483
40	0.16600	80	1.0840	120	1.2500

(e) If more than one BMP in series is necessary to achieve the required 80 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, and
A = the TSS Percent Removal Rate applicable to the first BMP
B = the TSS Percent Removal Rate applicable to the second BMP.

(f) Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include green infrastructure BMPs that optimize nutrient removal while still achieving the performance standards in Sections D(17), (18) and (19).

(g) 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.

(h) The Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-4.1(c)1 establish 300-foot riparian zones along Category One waters, as designated in the Surface Water Quality Standards at N.J.A.C. 7:9B, and certain upstream tributaries to Category One waters. A person shall not undertake a major development that is located within or discharges into a 300-foot riparian zone without prior authorization from the Department under N.J.A.C. 7:13.

(i) Pursuant to the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-11.2(j)3.i, runoff from the water quality design storm that is discharged within a 300-foot riparian zone shall be treated in accordance with this subsection to reduce the post-construction load of total suspended solids by 95 percent of the anticipated load from the developed site, expressed as an annual average.

(j) This 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.

(19) Stormwater Runoff Quantity Standards

(a) This subsection contains the minimum design and performance standards to control stormwater runoff quantity impacts of major development.

(b) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section E, complete one of the following:

[1] Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

[2] Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the 2-, 10- and 100-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; or

[3] Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10- and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.

(c) In order to reduce stormwater runoff effects on downstream flooding, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section E, design for the on-site storage of the water quality design storm (1.25" of rain in 2 hours) for new development and to the maximum extent practicable for redevelopment.

(d) The stormwater runoff quantity standards shall be applied at the site's boundary to each abutting lot, roadway, watercourse, or receiving storm sewer system.

E. Calculation of Stormwater Runoff and Groundwater Recharge

(1) Stormwater runoff shall be calculated in accordance with the following:

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

[1] 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:

https://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

[2] 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. The document is also available at:

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

(b) For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology above at E(1)(a)[1] and the Rational and Modified Rational Methods at Section E(1)(a)[2]. 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).

(c) In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.

(d) 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* or other methods may be employed.

(e) 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.

(2) Groundwater recharge may be calculated in accordance with the following:

The New Jersey Geological Survey Report GSR-32, A Method for Evaluating Groundwater-Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at the New Jersey Geological Survey website at: https://www.nj.gov/dep/njgs/pricelst/gsreport/gsr32.pdf;

or at New Jersey Geological and Water Survey, 29 Arctic Parkway, PO Box 420 Mail Code 29-01, Trenton, New Jersey 08625-0420.

F. Sources for Technical Guidance

(1) Technical guidance for stormwater management measures can be found in the documents listed below, which are available to download from the Department's website at:

http://www.nj.gov/dep/stormwater/bmp_manual2.htm.

(a) Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended and supplemented. Information is provided on stormwater management measures such as, but not limited to, those listed in Tables 1, 2, and 3.

(b) Additional maintenance guidance is available on the Department's website at: https://www.njstormwater.org/maintenance_guidance.htm.

(2) 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.

G. Solids and Floatable Materials Control Standards.

(1) Site design features identified under Section D(7) above, or alternative designs in accordance with Section D(8) above, 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. For exemptions to this standard see Section G(1)(b) below.

(a) Design engineers shall use one 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:

[1] 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

[2] 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 system floors used to collect stormwater from the surface into a storm drain or surface water body.

[3] For curb-opening inlets, including curb-opening inlets in combination inlets, 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 (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

(b) The standard in (1)(a) above does not apply:

[1] 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;

[2] Where the municipality agrees that the standards would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets;

[3] Where flows from the water quality design storm as specified in N.J.A.C. 7:8 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:

i. A rectangular space four and five-eighths (4.625) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or

ii. A bar screen having a bar spacing of 0.5 inches.

[4] Where flows are conveyed through a trash rack that has parallel bars with one-inch (1 inch) spacing between the bars, to the elevation of the Water Quality Design Storm as specified in N.J.A.C. 7:8; or

[5] 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.

H. Safety Standards for Stormwater Management Basins

(1) This section sets forth requirements to protect public safety through the proper design and operation of stormwater management BMPs. This section applies to any new stormwater management BMP.

(2) The provisions of this section are not intended to preempt more stringent municipal or county safety requirements for new or existing stormwater management BMPs. Municipal and county stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management BMPs to be retrofitted to meet one or more of the safety standards in Sections H(3)(a), H(3)(b), and H(3)(c) for trash racks, overflow grates, and escape provisions at outlet structures.

(3) Requirements for Trash Racks, Overflow Grates and Escape Provisions

(a) 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:

[1] The trash rack shall have parallel bars, with no greater than six-inch spacing between the bars;

[2] The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure;

[3] 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; and

[4] The trash rack shall be constructed of rigid, durable, and corrosion resistant material and designed to withstand a perpendicular live loading of 300 pounds per square foot.

(b) 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:

[1] The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.

[2] The overflow grate spacing shall be no less than two inches across the smallest dimension

[3] 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.

(c) Stormwater management BMPs shall include escape provisions as follows:

[1] If a stormwater management BMP has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions include the installation of permanent ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management BMPs. With the prior approval of the municipality pursuant to VIII.C, a free-standing outlet structure may be exempted from this requirement;

[2] Safety ledges shall be constructed on the slopes of all new stormwater management BMPs having a permanent pool of water deeper than two

and one-half feet. Safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See VIII.E for an illustration of safety ledges in a stormwater management BMP; and

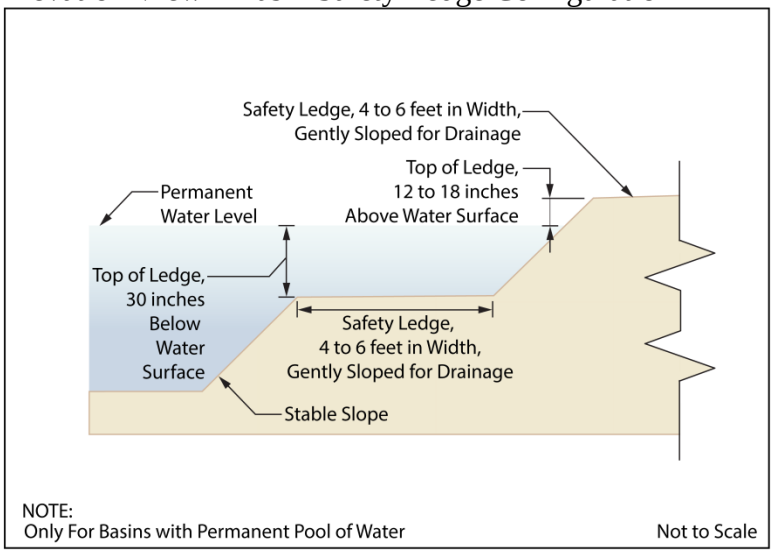
[3] In new stormwater management BMPs, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than three horizontal to one vertical.

(4) Variance of Exemption from Safety Standard

A variance or exemption from the safety standards for stormwater management BMPs may be granted only upon a written finding by the municipality that the variance or exemption will not constitute a threat to public safety.

(5) Safety Ledge Illustration

Elevation View – Basin Safety Ledge Configuration



I. Requirements for a Site Development Stormwater Plan

(1) Submission of Site Development Stormwater Plan

(a) Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section I(3) below as part of the submission of the application for approval.

(b) The applicant shall demonstrate that the project meets the standards set forth in this ordinance.

(c) The applicant shall submit three copies of the materials listed in the checklist for site development stormwater plans in accordance with Section I(3) of this ordinance and an electronic copy.

(2) Site Development Stormwater Plan Approval

The applicant's Site Development project shall be reviewed as a part of the review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the municipality's review engineer to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

(3) Submission of Site Development Stormwater Plan

The following information shall be required:

(a) 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 1"=200' or greater, showing 2-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 flood plains 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 manmade features not otherwise shown.

(b) Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its surroundings should be submitted. 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.

(c) Project Description and Site Plans

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 will 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 for proposed changes in natural conditions shall also be provided.

(d) Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections C through E 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.

(e) Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

[1] Total area to be disturbed, 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.

[2] 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.

(f) Calculations

[1] Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section D of this ordinance.

[2] 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.

(g) Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section J.

(h) Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipality's review engineer, waive submission of any of the requirements in Section I(3)(a) through I(3)(f) of this ordinance 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.

J. Maintenance and Repair

(1) Applicability

Projects subject to review as in Section A(3) of this ordinance shall comply with the requirements of Sections J(2) and J(3).

(2) General Maintenance

(a) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.

(b) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). The plan shall contain information on BMP location, design, ownership, maintenance tasks and frequencies, and other details as specified in Chapter 8 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.

(c) If the maintenance plan identifies a person other than the property owner (for example, a developer, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's or entity's agreement to assume this responsibility, or of the owner's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

(d) 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.

(e) If the party responsible for maintenance identified under Section J(2)(c) above is not a public agency, the maintenance plan and any future revisions based on Section J(2)(g) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.

(f) Preventative and corrective maintenance shall be performed to maintain the functional parameters (storage volume, infiltration rates, inflow/outflow capacity, etc.).of the stormwater management measure, including, but not limited to, 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 non-vegetated linings.

(g) The party responsible for maintenance identified under Section J(2)(c) above shall perform all of the following requirements:

[1] 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;

[2] evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed; and

[3] 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 Sections J(2)(f) and (2)(g) above; <u>and</u>

<u>[4] post a two year maintenance guarantee in accordance with N.J.S.A.40:55D-53.</u>

(h) The requirements of Sections J(2)(c) and J(2)(d) do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency, subject to all applicable municipal stormwater general permit conditions, as issued by the Department.

~~*Note: It may be appropriate to delete requirements in the maintenance and repair plan that are not applicable if the ordinance requires the facility to be dedicated to the municipality. If the municipality does not want to take this responsibility, the ordinance should require the posting of a two year maintenance guarantee in accordance with N.J.S.A. 40:55D-53.*~~

~~*Maintenance and inspection guidance can be found on the Department's website at:* https://www.njstormwater.org/maintenance_guidance.htm.~~

(i) In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person. Nonpayment of such bill may result in a lien on the property.

(3) Nothing in this subsection shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

K. Standards for Stormwater Collection and Conveyance Systems.

(1) All site development stormwater plans for subdivisions, site plans and individual residential lots shall include provisions for safely and satisfactorily controlling stormwater runoff, drainage and stream flows in a manner that will not adversely affect existing and proposed properties, both upstream and downstream of the site. When developing a site in an aquifer outcrop area or other area affecting same, the site development stormwater plan shall include provisions for on-site recharge of underground formations.

(2) All streets shall be provided with stabilized swales, catch basins and pipes where they may be necessary for proper surface drainage. The standards in this subsection shall not be satisfied by the construction of dry wells. The system shall be adequate to carry off or store the stormwater and natural drainage water that originates within the development boundaries and that which originates beyond the development boundaries and passes through the development as permitted under this subsection. No stormwater runoff of natural drainage water shall be so diverted as to overload existing drainage systems or create flooding or the need for additional drainage structures on other lands without proper and approved provisions being made for taking care of these conditions, including off-tract improvements.

(3) The stormwater collection and conveyance system shall not impact adjoining properties and upstream and downstream drainage facilities.

(4) The stormwater collection and conveyance systems shall be designed for a storm with a frequency of one in 25 years, except major drainage channels, detention

basins and other facilities as deemed necessary by the Township Engineer shall be designed for a storm with a frequency of one in 100 years.

(5) All drainage channels and detention ponds shall be designed with a one-foot freeboard.

(6) Pipe sizing shall be determined by the Manning formula with "n=0.013" for concrete pipe, “n=0.009” for smooth lined polyethylene and polypropylene pipe and "n=0.22" for corrugated pipe. The pipe size determined to be adequate for the runoff computed shall be increased by at least one standard pipe size for all pipes less than 30 inches in size for the type pipe being used in order to provide adequate allowance for the normal accumulation of sediment and debris in the storm drainage system. The minimum pipe size in a surface water drainage system shall not be less than 15 inches in diameter.

(7) Catch basins shall be located at all intersections and located in streets with inlets on both sides of the street at maximum intervals of 400 feet or such distances as required to prevent the flow of surface water from exceeding 6.0 cubic feet per second at the catch basin inlet at the design storm frequency. Access manholes shall be placed at maximum four-hundred-foot intervals throughout the system and at pipe junctions where there are catch basins.

(8) Dished or valley gutters on municipal streets shall be permitted only at intersections involving minor streets. Dished gutters shall not be permitted on arterial or collector roads.

(9) Storm drainpipes running longitudinally along streets shall not be located under curbing.

(10) Materials used in the construction of storm sewers shall be constructed of reinforced concrete, ductile iron, corrugated polyethylene, or corrugated polypropylene or, when approved by the municipal engineer, corrugated metal. The most cost-effective materials shall be permitted that conform to local site conditions and reflect the relevant operations, maintenance, and system character of the municipal stormwater system.

(a) The following apply to reinforced concrete pipe:

[1] Circular reinforced concrete pipe and fittings shall meet the requirements of ASTM C76.

[2] Elliptical reinforced concrete pipe shall meet the requirements of ASTM C507.

[3] If rubber gaskets are used for circular pipe, the joint design and joint material shall conform to ASTM C443.

[4] If external sealing bands are used for joints for elliptical pipe, they shall conform to ASTM C877.

[5] Mortar joints shall conform to Sections 602.05 and 914.03 of the New Jersey Department of Transportation's "Standard Specifications for Road and Bridge Construction," incorporated herein by reference, as amended and supplemented.

[6] All pipe shall be Class III, minimum unless loading conditions call for stronger pipe (that is, higher class).

(b) Ductile iron pipe shall conform to ANSI/AWWA C151/A21.51. Joints shall conform to ANSI/AWWA C111/A21.11 or ANSI/AWWA C115/A21.15 as appropriate. Pipe shall be designed in accordance with ANSI/AWWA C150/A21.50. The outside of the pipe shall be coated in accordance with ANSI/AWWA C151/A21.51, and the inside lined in accordance with ANSI/AWWA C104/A21.4. Ductile iron pipe shall be installed in accordance with AWWA C600.

(c) Corrugated polyethylene pipe shall conform to AASHTO M252 for three through 10 inches and AASHTO M294 for size 12 inches and larger. All pipes greater than 12 inches in diameter shall be Type S, unless conditions dictate otherwise. Materials shall conform to ASTM D3350, "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials." Pipe joints and fittings shall be compatible with the pipe material and shall conform to the same standards and specifications as the pipe material. Pipe couplers shall not cover less than one full corrugation on each section of pipe. Installation shall be in accordance with ASTM D2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications." Backfill material shall be placed in six-inch lifts and compacted to 95 percent minimum dry density, per AASHTO T99. In areas of high ground water tables, design engineers shall check for flotation.

(d) Corrugated polypropylene pipe shall conform to ASTM D4101, Standard Specification for Polypropylene Injection and Extrusion Materials. Polypropylene pipe and fittings shall conform to ASTM F2764 or ASTM F2736, depending on size. Pipe joints and fittings shall be compatible with this material and conform to the same standard. Installation shall be in accordance to ASTM D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications. Backfill material shall be placed in six-inch lifts and compacted to 95 percent minimum dry density per AASHTO T99. In areas of high ground water tables, design engineers shall check for flotation.

(e) Corrugated metal pipe, subject to review and approval by the municipal engineer.

(11) Catch basins shall be designed in accordance with Section H.

(12) Manholes shall be precast concrete and shall be constructed in accordance with the New Jersey Department of Transportation Standard details.

(13) Poured concrete headwalls or precast flared end pipe sections shall be constructed at the point of discharge of all storm drains, in accordance with the latest New Jersey Department of Transportation standard plans and specifications. They shall include precast, cast-in-place or grouted riprap energy dissipaters at the discharge point.

(14) Vegetation. All drainage ditches, swales, channels, diversion dikes and berms shall be stabilized with vegetation in accordance with the standards for soil erosion and sediment control in New Jersey with specific regard to slope, velocity and other applicable design factors.

(15) Exemption from the standards. If Cranbury Township grants a waiver from the standards set forth above, a written report shall be made to the county detailing the nature of the waiver, the change(s) requested, and an explanation of the reasons for the decision.

(16) All blocks and lots in all subdivisions shall be graded to secure proper drainage away from buildings and to prevent the collection of pools of stormwater. Finished floor elevation and exterior grading shall be shown on all lots. Lot grading shall be a minimum of 2% and a maximum of one vertical to three horizontal.

(17) In all subdivisions, land subject to periodic or occasional flooding (flood hazard areas) shall not be platted for residential occupancy nor for any other purpose where such flooding may endanger life or property or which would aggravate the flood hazard. Such land shall be considered for open spaces or other similar uses.

(18) Drainage structures which are located on State or County highway rights-of-way shall be approved by the State or County highway engineer's office, and a letter from that office indicating such approval shall be directed to the secretary of the Board, and either shall be received prior to the final plat approval or such approval shall be conditioned upon the receipt of such letter.

(19) Where a subdivision is traversed by a watercourse, surface or underground drainageway or drainage system, channel or stream, there shall be a dedicated drainage right-of-way easement to the Township conforming substantially to the lines of such watercourse and such further width or construction, or both, as shall be adequate to accommodate expected stormwater runoff and maintenance activities in the future.

(20) Surface stormwater drainage may be carried in open ditches outside the right-of-way of the local streets or other suitable drainage structures within the right-of-way as may be approved by the Township Engineer. Stormwater drainage facilities, underground pipeline inlets, catch basins, manholes, culverts, swales and other drainage facilities shall be designed with sufficient capacity to accommodate anticipated runoff of at least a twenty-five-year storm at such time as the drainage basin in which the development is located is fully developed. This standard may be increased when, in the opinion of the Township Engineer circumstances warrant such increase.

L. Building drain connections to stormwater collection and conveyance systems.

(1) All proposed dwellings and buildings within a Major Development having ~~with~~ a basement subject to groundwater or surface water flooding shall be provided a connection to a storm drainage system for the purposes of utilizing this connection for possible discharge of sump pump and/or gravity basement drains. The connections to the storm sewer shall meet the following requirements:

(a) Each dwelling unit or other building with a basement shall be provided a four-inch diameter (minimum) connection to be located between curb and sidewalk and five feet towards the center of the lot from the edge of the interior side of the driveway depressed curb.

(b) Lots fronting roads with existing or proposed storm sewers will be permitted to provide a connection as reviewed and approved by the Township Engineer.

(c) Lots fronting roads with no existing or proposed storm sewers shall also be required to provide a connection for basement drainage by providing a separate drainage system which shall discharge to an approved storm sewer, drainage ditch, seepage pit or by other methods approved by the Township Engineer. Seepage pits for individual dwelling will not be permitted when a storm sewer or~~,~~ drainage ditch ~~or other stormwater system~~ is within 200 feet of the subject property unless otherwise approved by the Township Engineer.

(d) Where it is necessary to construct a separate drainage system to accommodate flows from gravity basement drains or sump pumps due to absence of existing or proposed storm sewers, a design prepared by a licensed professional engineer shall be submitted for approval. Plans for all minor or major subdivisions and site plans are required to include provisions for a drainage connector from each lot.

(e) There shall be no sump pump discharge or mechanical discharge of any stormwater directly onto any Township street or sidewalk, into the sanitary sewer or directly into any public drywell in accordance with Township Code Chapter 132.

M. Surface Water Runoff Control Plan Standards for Residential Lots

(1) All blocks and lots in all subdivisions shall be graded to secure proper drainage away from buildings and to prevent the collection of pools of stormwater. Finished floor elevation and exterior grading shall be shown on all lots.

(2) At the time of application to the Township Construction Code Official for a building permit for any building within either an individual lot or part of an approved subdivision or site plan, the applicant shall submit a surface water runoff control plan to the Township Engineer for review and approval.

(3) At a minimum, the following items are required as part of the surface water runoff control plan:

(a) An outbound survey, inclusive of all easements, of the property on which the structure is proposed, as prepared by a New Jersey licensed land surveyor, indicating the name and the development and/or applicant, Tax Map, lot, block and street address. The scale of the survey shall be no smaller than one inch equals 30 feet.

(b) Footprint of the proposed dwelling unit.

(c) The basement elevation, garage elevation, and finished floor elevation of the proposed building, based upon USC&GS MSL data. Spot grades should be provided at all corners of the building footprint and garage apron.

(d) Data showing that the lowest finished floor of the structure, including the basement, is at least one foot above the delineated one-hundred-year flood elevation of any watercourse on or near the property, or one foot above the seasonal high water table, as determine by test pit, soil boring, or investigative work done in conjunction with an on-site individual sewage disposal system.

(e) Provision of sufficient, existing and proposed contour lines and spot elevations to show the direction of surface water runoff, yard slopes greater than 2% or less than one vertical to three horizontal, elimination of any standing water conditions, and grading which will not adversely impact adjoining properties.

(f) The location of proposed potable water and sanitary sewer services or potable water supply well and on-site individual sewage disposal system, as approved by the Board of Health, including all fill and grading required to install the disposal system. The applicant shall show the location of any proposed sump pump pit and the point of discharge on the property.

(g) Driveway location.

(h) Any or all of the above standards may be waived by the Township Engineer, as site conditions may require. An acceptable surface water runoff control plan report must be issued by the Township Engineer prior to the issuance of a building permit by the Township Construction Code Official.

N. Penalties

Any person(s) who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the penalties set forth in Section 1-15 of the Township Code.

Section 2. Repealer. All ordinances or parts thereof inconsistent herewith are repealed as to such inconsistencies.

Section 3. Severability. If any section, subsection, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Section 4. Effective date. This ordinance shall take effect from and after its adoption any publication as required by law.

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DEBRA A. RUBIN, RMC
MUNICIPAL CLERK