



Township of Hillsborough

COUNTY OF SOMERSET
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ORDINANCE 2024-15

Ordinance Amending Chapter 262 “Stormwater Control”, Article I “Surface Water Runoff”, of the Code of the Township of Hillsborough, Somerset County, New Jersey, To Address Stormwater Management Requirements in the Municipality

WHEREAS, the New Jersey Department of Environmental Protection (“NJDEP”) has by way of their November 1, 2023 Tier A Municipal Stormwater General Permit renewal under the New Jersey Discharge Elimination System (“NJPDES”) defined minimum requirements and published a sample ordinance section; and

WHEREAS, the NJDEP has promulgated a model Stormwater Management Ordinance to establish requirements for flood control, groundwater recharge and pollutant reduction to achieve through the use of stormwater management measures, including green infrastructure, best management practices and nonstructural stormwater management strategies; and

WHEREAS, the Township now wishes to adopt the within ordinance based on the NJDEP Stormwater Management model ordinance to manage stormwater within the Township of Hillsborough.

NOW, THEREFORE, BE IT ORDAINED by the Township Committee of the Township of Hillsborough, County of Somerset, State of New Jersey, that Chapter 262 “Stormwater Control” of the Municipal Code of the Township of Hillsborough is amended as follows: **New language is underlined thus and deletions are indicated with strikethroughs ~~thus~~.**

Section 1. Chapter 262 “Stormwater Control”, Article I “Surface Water Runoff”, of the Municipal Code of the Township of Hillsborough is amended as follows

Article I Surface Water Runoff

§ 262-1. Scope and purpose.

- A. 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.
- B. Purpose. It is the purpose of this article to establish minimum stormwater management requirements and controls for "major development" and “non-major development” as defined in § 262-2.
- C. Applicability.
 - (1) This article shall be applicable for the following major developments:

- (a) Nonresidential major developments; and
 - (b) Aspects of residential major developments that are not preempted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
- (2) This article shall also be applicable to all major developments undertaken by Township of Hillsborough.
 - (3) An application required by ordinance pursuant to C(1) above that has been submitted prior to December 10, 2024 shall be subject to the stormwater management requirements in effect on December 9, 2024.
 - (4) An application required by ordinance for approval pursuant to C(1) above that has been submitted on or after March 2, 2021, but prior to December 10, 2024, shall be subject to the stormwater management requirements in effect on December 9, 2024.
 - (5) Notwithstanding any rule to the contrary, a major development for any public roadway or railroad project conducted by a public transportation entity that has determined a preferred alternative or reached an equivalent milestone before July 17, 2023, shall be subject to the stormwater management requirements in effect prior to July 17, 2023.
 - (6) Non-major developments as defined below.

D. Compatibility with other permit and ordinance requirements. Development approvals issued pursuant to this article 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 article shall be held to be the minimum requirements for the promotion of the public health, safety and general welfare. This article is not intended to interfere with, abrogate or annul any other ordinances, rule or regulation, statute or other provision of law except that, where any provision of this article imposes restrictions different from those imposed by any other ordinance, rule or regulation or other provision of law, the more restrictive provisions or higher standards shall control.

§ 262-2. Definitions.

For the purpose of this article, the following terms, phrases words, and their derivations s 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 the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

CAFRA CENTERS, CORES or NODES

Those areas within boundaries incorporated by reference or revised by the Department in accordance with N.J.A.C. 7:7-13.16.

CAFRA PLANNING MAP

The map used by the Department to identify the location of Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes. The CAFRA Planning Map is available on the Department's Geographic Information System (GIS).

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 article.

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 stormwater management measure itself.

CORE

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

COUNTY REVIEW AGENCY

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

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

DEPARTMENT

The New Jersey Department of Environmental Protection.

DESIGNATED CENTER

A state development and redevelopment plan center as designated by the State Planning Commission such as urban, regional, town, village or hamlet.

DESIGN ENGINEER

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

DEVELOPMENT

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

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 are 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.

EMPOWERMENT NEIGHBORHOOD

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

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:

- A. Treating stormwater runoff through infiltration into subsoil;
- B. Treating stormwater runoff through filtration by vegetation or soil; or
- C. Storing stormwater runoff for reuse.
- D. A New Jersey Department of Environmental Protection defined stormwater management measure as listed in the NJ Stormwater Best Management Practices Manual, most recent revision.

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 fourteen-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey.

IMPERVIOUS SURFACE

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

INFILTRATION

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

LEAD PLANNING AGENCY

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

- A.** 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 1/4 acre or more of regulated impervious surface since February 2, 2004;
 - (3)** The creation of 1/4 acre or more of regulated motor vehicle surface since March 2, 2021; or
 - (4)** A combination of Subsection A(2) and (3) of this definition that totals an area of 1/4 acre or more. The same surface shall not be counted twice when determining if the combination area equals 1/4 acre or more.
- B.** "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 Subsection A(1), (2), (3), or (4) of this definition. 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.

MUNICIPALITY

Any Township, borough, town, township or village.

NEW JERSEY STORMWATER BEST MANAGEMENT PRACTICES (BMP) MANUAL (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 article. 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 article. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this article, provided the design engineer demonstrates to the municipality, in accordance with § 262-5 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 article.

NODE

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

NON-MAJOR DEVELOPMENT

An individual development, as well as multiple developments that individually or collectively result in:

- (1) The creation of 1/4 acre or less of regulated impervious surface since February 2, 2004;
- (2) The creation of 1/4 acre or less of regulated motor vehicle surface since March 2, 2021; or
- (3) A combination of Subsection A(2) and (3) of this definition that totals an area of 1/4 acre or less. The same surface shall not be counted twice when determining if the combination area equals 1/4 acre or less.

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, Township of Hillsborough or political subdivision of this state and any state, interstate or federal agency.

POLLUTANT

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

PUBLIC ROADWAY OR RAILROAD

A pathway for use by motor vehicles or trains that is intended for public use and is constructed by, or on behalf of, a public transportation entity. A public roadway or railroad does not include a roadway or railroad constructed as part of a private development, regardless of whether the roadway or railroad is ultimately to be dedicated to and/or maintained by a governmental entity.

PUBLIC TRANSPORTATION ENTITY

A Federal, State, county, or municipal government, an independent State authority, or a statutorily authorized public-private partnership program pursuant to P.L. 2018, c. 90 (N.J.S.A. 40A:11-52 et seq.), that performs a public roadway or railroad project that includes new construction, expansion, reconstruction, or improvement of a public roadway or railroad.

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:

- A. A net increase of impervious surface;
- B. 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);
- C. The total area of impervious surface proposed to be newly collected by an existing stormwater

conveyance system; and/or

- D. 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:

- A. The total area of motor vehicle surface that is currently receiving water;
- B. 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 major development is to occur or has occurred.

SOIL

All unconsolidated mineral and organic material of any origin.

STATE DEVELOPMENT AND REDEVELOPMENT PLAN METROPOLITAN PLANNING

AREA (PA1)

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

STATE PLAN POLICY MAP

The geographic application of the State Development and Redevelopment Plan's goals and statewide policies, and the official map of these goals and policies.

STORMWATER

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

STORMWATER MANAGEMENT BASIN

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

STORMWATER MANAGEMENT MEASURE

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

STORMWATER 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.

STORMWATER RUNOFF

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

TIDAL FLOOD HAZARD AREA

A flood hazard area in which the flood elevation resulting from the two-, ten-, 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.

URBAN COORDINATING COUNCIL EMPOWERMENT NEIGHBORHOOD

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

URBAN ENTERPRISE ZONES

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

URBAN REDEVELOPMENT AREA

Previously developed portions of areas:

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

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-, ten-, 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 or WETLAND

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

§ 262-3. General standards.

Design and performance standards for stormwater management measures.

- A.** Stormwater management measures for major development shall be designed to meet the erosion control, groundwater recharge, stormwater runoff quantity control and stormwater runoff quality treatment standards as follows: [Amended 2-23-2021 by Ord. No. 2021-01; 3-8-2022 by Ord. No. 2022-01]]
- (1)** The minimum 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 standards for groundwater recharge, stormwater quality, and stormwater runoff quantity shall be met by incorporating green infrastructure.
- B.** The standards in this article apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or water quality management plan adopted in accordance with Department rules.

§ 262-4. Stormwater management requirements for non-major development.

- A. All development shall be provided with a stormwater management plan consisting of, but not limited to, inlets, manholes and pipes where necessary for proper surface drainage. The system shall be adequate to carry off and/or store the stormwater and natural surface runoff, which originates not only within the property in question, but also beyond the tract boundaries.
- B. Where possible, all runoff within a site shall ultimately leave the site in the same watershed in which it originated and shall be released in such a manner so as to not overload existing drainage systems, create flooding creating a need for additional drainage facilities on other public or private lands or increase predevelopment erosion of adjacent lands.
- C. The peak rate of runoff from a site during and after development shall not exceed the predevelopment peak rate of runoff. Development upstream of known areas of problem flooding shall be required to further reduce the peak rate of runoff below the predeveloped rate. Where the upstream tributary drainage area exceeds fifty (50) acres, the standards established in the Technical Manual for Stream Encroachment, N.J.A.C. 7:13-2.8, Stormwater Management, NJDEP, shall govern.
- D. The increase in volume of runoff from a site, during and after development, from the predevelopment total of volume of runoff shall be minimized. Runoff control measures shall be used to retard or reduce -runoff and increase recharge. Depending on the soil characteristics natural and artificial recharge area and systems should be employed whenever practical to minimize the volume of surface water runoff. These include, but are not limited to, infiltration pits, dry wells, infiltration trenches and the extensive use of sheet flow through vegetated areas. The use of such measures will not eliminate or reduce, even partially, the need for other requirements of this section.
- E. The peak rate of runoff for areas of up to twenty (20) acres shall be calculated by the rational method or derivatives. The equation for the rational method is as follows:

$$Q_p = CIA$$

Where

Q_p = The peak runoff rate in cubic feet per second (cfs).

C = The runoff coefficient.

I = The average rainfall intensity in inches per hour (in/hr), occurring at the time of concentration T_c (min).

T = The time of concentration in minutes (min).

A = The size of the drainage area in acres (ac).

- (1) Typical runoff coefficients (C values) are provided in the New Jersey Department of Transportation (NJDOT) Roadway Design Manual Chapter 10 Table 10.3-B. Runoff coefficient C used in the rational formula shall be weighted if there is more than one (1) kind of land use within the drainage basin under consideration.

- (2) The time of concentration (tc) is defined as the time required for water to reach the point in question from the most hydraulically distant point in the basin. Time of concentration (tc) shall be estimated from the Nomograph for the Determination of Time of Concentration, prepared by the State of New Jersey Highway Authority. The analysis shall also consider the procedure outline in Section 3.12(c) for Technical Release (TR) Number 55, Urban Hydrology for Small Watersheds, United States Department of Agriculture, Soil Conservation Series, as supplemented and amended (SCS method).
- (3) Rainfall intensity as a function of duration and storm recurrence frequency shall be based upon geographically appropriate data as depicted in the plates in Technical Paper Number 25, Rainfall Intensity Duration-Frequency Curves, United States Department of Commerce, Weather Bureau, as supplemented and amended. Intensity curves may be based on local rainfall frequency data, where available. In all instances, a minimum time of concentration of five (5) minutes should be used.
- (4) The peak rate of runoff for areas greater than twenty (20) acres shall be calculated by hydrograph analysis method as outlined in the latest edition of Urban Hydrology for Small Watersheds Technical Release Number 55 (TR55).
- F. Runoff Volume Calculation. Runoff volume shall be calculated by the hydrograph analysis method as outlined in the latest edition of Urban Hydrology for Small Watershed Technical Release Number 55 (SCS method). This method shall be used for watersheds having drainage areas greater than twenty (20) acres. For drainage areas of less than twenty (20) acres, the rational method triangular hydrograph approximation with the peak rate occurring at the time of concentration and the end of the hydrograph at three (3) times the time of concentration may be used as an alternative.

G. System Design.

- (1) Collection systems shall be designed to accommodate the intensity for a storm frequency of once in twenty-five (25) years.
- (2) Hydraulic capacity for open channel or closed conduit flow shall be determined by the Manning equation or charts/nomographs based on the Manning equation. The hydraulic capacity is termed "Q" and is expressed as discharge in cubic feet per second. The Manning equation is as follows:

$$Q_p = \frac{1.486 A R^{2/3} S^{1/2}}{n}$$

Where

N = Manning's roughness coefficient.*

A = Cross-sectional area of flow in square feet.

R = Hydraulic radius in feet (R = Q/P, where P is equal to the wetted perimeter).

S = Slope of conduit in feet per foot.

*NOTE: The Manning roughness coefficients to be utilized are shown in the Technical Manual for Stream Encroachment, NJDEP, Table 3.2-11 (A-1).

- (3) Velocities in open channels at design flow shall not be less than five-tenths (0.5) foot per second and not greater than that velocity which will begin to cause erosion or scouring of the channel. Permissible velocities for swales, open channels and ditches are allowed for the appropriate soil type based on the Soil Conservation Service Standards for Soil Erosion and Sediment Control in New Jersey, as amended.

- (4) Velocities in closed conduits at design flow shall be at least two (2) feet per second but not more than ten (10) feet per second.
- (5) No pipe size in the storm drainage system shall be less than fifteen (15) inches in diameter.
- (6) All discharge pipes shall terminate with a precast concrete flared end section or a cast-in-place concrete headwall with or without wingwalls as conditions dictate.
- (7) The spacing of inlets shall be such that surface water shall not flow for more than five hundred (500) feet or the quantity of water is such that it caused ponding of water deeper than two (2) inches at Type B and Type E inlets, whichever is the lesser distance. If due to the slope of the approach prior to the inlet, eighty percent (80%) of the stormwater does not enter the inlet, decreased spacing and depth of water permissible shall be required. Sufficient inlets will be placed to eliminate any flow exceeding two (2) cubic feet per second across any roadway intersections or pedestrian crosswalk.
- (8) Dished gutters shall be permitted at any street intersection on rural and local streets and at the intersection of rural and local streets with minor collector streets and at the intersection of minor collector streets with major collector streets where the street of the lower classification is to be officially designated and signed as a stop street. In such case, the dished gutter shall cross only the street of the lower classification. At the intersections of primary and secondary arterial streets and major collector streets, sufficient catch basins, at the discretion of the reviewing agency, shall be installed at each street intersection to avoid gutter overflow and at low points in the street grade, and dished gutters shall not be permitted.
- (9) Manhole spacing shall increase with pipe size. The maximum spacing shall be five hundred (500) feet for fifteen (15) to eighteen (18) inches; six hundred (600) feet for twenty-one (21) to thirty-six (36) inches; and seven hundred (700) feet for forty-two (42) inches and greater.

H. Detention Facilities.

- (1) Development shall use the best available technology to accommodate stormwater management by natural drainage strategies as indicated in subsection D of this section.
- (2) Detention and all other stormwater management facilities shall conform to the standards under the New Jersey Stormwater Management Act, N.J.S.A. 40:55D-93 et seq.
- (3) Where detention facilities are deemed necessary, they shall accommodate site runoff generated from two-year, ten-year and one hundred-year storms considered individually, unless the detention basin is classified as a dam, in which case the facility must also comply with the Dam Safety Standards, N.J.A.C. 7:20. These "design storms" shall be defined as either a twenty-four-hour storm using the rainfall distribution recommended by the United States Soil Conservation Service (such as United States Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release Number 55) or as the estimated maximum rainfall for the estimated time of concentration of runoff at the site when using a design method such as the modified rational method. Runoff greater than that occurring from the one hundred-year, twenty-four-hour storm will be passed over an emergency spillway.

Detention will be provided such that, after development, the peak rate of flow from the site will not exceed that by similar storms prior to development.

- (4) In calculating the site runoff to be accommodated by a detention facility, the method to be used is a tabular hydrograph method as presented in TR Number 55 (SCS method), as supplemented and amended. The pre-developed lands in the site shall be assumed to be in good condition, if the lands are woods, or with conservation treatment, if the land is cultivated, regardless of conditions existing at the time of concentration.

- (5) Detention facilities shall be located as far horizontally from surface water and as far vertically from groundwater as is practicable. A complete soils report for the detention basins and surrounding areas shall be submitted. The report should address the effect groundwater will have on the construction and maintenance of the detention basins.
- (6) Only one-half (1/2) of the area devoted to detention or retention facilities shall be considered non-impervious surfaces in calculating the maximum percentages as set forth in other sections of this chapter. The area devoted shall be the area encompassed by the depth of water to the emergency spillway, plus one (1) foot.
- (7) The top of the excavation or the toe of the outside slope shall be set back twenty-five (25) feet from adjoining nonresidential property lines and fifty (50) feet from an adjoining property line of a lot on which there is a residential use. The edge of the design high water for the detention basins shall be set back one hundred (100) feet existing or proposed dwelling units.
- (8) The top of the excavation or the toe of the outside slope shall be set back fifty (50) feet from the edge of the pavement from adjoining roads and shall be set back twenty-five (25) feet from the adjoining right-of-way line for any right-of-way dedicated for use as a public road.
- (9) Dry Detention Basins. The following design standards shall apply to all dry detention basins:
 - (a) The maximum embankment side slopes shall have the ratio of one (1) vertical to three (3) horizontal.
 - (b) Basin bottom shall meet the following specifications:
 - 1] Traverse slope (to low flow channel); minimum two percent (2%);
 - 2] Low flow channel if sodded; minimum slope two percent (2%);
 - 3] Low flow channel if concrete; slope not less than one percent (1%);
 - 4] Riprap low flow channel will not be accepted.
 - (c) An area ten (10) feet wide with a maximum slope of two percent (2%) shall be constructed at the top of the bank surrounding the basin.
 - (d) Vegetation stabilization cover shall be provided throughout the basin and landscaping shall be provided on the perimeter of the basin as approved by the Board's landscape architect.
 - (e) The basin floor shall lie a minimum of two (2) feet above the seasonal high groundwater table.
- (10) Wet detention/retention basins are discouraged. Wet basins may be permitted only if no other above ground stormwater management facility is feasible.
- (11) Underground detention/retention basins are discouraged. Underground detention/retention basins may be permitted only if no other above ground stormwater management facility is feasible.

I. Protecting Water Quality.

- (1) In addition to addressing water quantity generated by development, a stormwater management system shall also enhance the water quality of stormwater runoff.
- (2) In order to enhance water quality of stormwater runoff, stormwater management shall provide for the control of a water quality design storm. The water quality design storm shall be defined as the NJDEP Water Quality Design Storm.

- (3) The water quality design storm shall be controlled by best management practices. These include but are not limited to the following:
 - (a) In dry detention basins, provisions shall be made to ensure that the runoff from the water quality design storm is retained such that not more than ninety percent (90%) will be evacuated prior to thirty-six (36) hours for all nonresidential projects or eighteen (18) hours for all residential projects. The retention time shall be considered a brim-drawdown storage. The retention time shall be reduced in any case which would require an outlet size diameter of three (3) inches or less. Therefore, three-inch diameter orifices shall be the minimum allowed. The depth of the water quality storm should not exceed two (2) feet in depth.
 - (b) In permanent ponds or wet basins, the water quality requirements of this section shall be satisfied where the volume of permanent water is at least three (3) times the volume of runoff produced by the water quality design storm.

J. Principal Outlets Quantity Control.

- (1) All principal outlet structures shall be concrete block or reinforced concrete. All construction joints are to be watertight. The outlet structure can consist of a riser, culvert pipe and/or weir outlet and must be accessible from the buffer area/access road when the basin is operational at full design flow for the 100-year design storm event. To minimize the chance of clogging and to facilitate cleaning, outlet openings, other than subsection K3a above, shall be at least six (6) inches in diameter. Similarly, riser pipes, if utilized, shall be at least eight (8) inches in diameter. All pipe joints are to be watertight, reinforced concrete pipe. In addition, trash racks and/or antivortex devices may be required where deemed necessary by the Township. Outlet control structures should be protected by maintenance free trash racks. Trash racks should be designed to be on an incline with a clear opening area large enough so that debris buildup does not impede the area of the opening it protects. The trash rack should be a hinged rack and should avoid moving parts. It should be able to be opened to gain access for cleaning the outlet pipe, and should be made of a noncorrosive material (stainless steel or aluminum).
- (2) Eight-inch thick anti-seep collars are to be installed along outlet pipes. Such collars shall be constructed of reinforced concrete with minimum Number 5 bars, each way, and two (2) inches of cover.
- (3) Where applicable, a concrete cradle shall be provided for outlet pipes.
- (4) Suitable lining shall be placed upstream and downstream of principal outlets as necessary to prevent scour and erosion. Such lining shall conform to the criteria contained in Standards for Soil Erosion and Sediment Control in New Jersey, published by the New Jersey State Soil Conservation Committee.
- (5) All outlet facilities shall be designed to prevent the potential hazard of a child's or an adult's either being carried into the opening or being held against the outlet by the pressure of the flowing stream waters, even during a one hundred-year storm.
- (6) Safe outlet structure design can encompass either outlet risers, gratings, trash racks or other means that, in the opinion of the Planning or Zoning Board, provide the desired level of safety.
- (7) Outlet structures should be designed to facilitate outlet operation and maintenance as the water level rises and to permit clearing either during or after a storm. Structural support members, steps, rungs or ladders should be provided to allow easy escape opportunities for a child or an adult without having these support members, ladders, etc., impede the clearing of trash from the outlet structure or the upward movement of trash from the outlet structure or the upward movement of trash as the water level rises.

- (8) The use of thin metal plates for trash rack bars, hand hold supports, sharp crested weirs or orifices are prohibited because of the potential for accidents. Wire mesh fabric is similarly prohibited due to its poor suitability for trash clearance.
- (9) Any outlet protective facility should have lockable hinged connections providing adequate access to thoroughly clean the area enclosed by the structure and to facilitate removal of accumulated debris and sediment around the outlet structure.
- (10) The outlet protective structure should have negligible influence upon the hydraulic performance of the outlet structure.
- (11) All outlet structures shall be structurally sound and shall be designed to withstand, without failure or permanent deformation, all structural loads, hydrostatic, dynamic or otherwise, which impact upon it during the design life of the installation. They shall be maintenance free to the maximum extent possible.
- (12) The detention/retention basin side slope walls shall be graded to slopes no greater than three (3) horizontal to one (1) vertical for a distance no less than twenty-five (25) feet on all sides of the outlet structure.
- (13) Other means of attaining the same outlet safety condition, such as inaccessible outlet locations, weirs, cascades, etc., will be considered as approvable if the same goals were attained.
- (14) Existing basins and outlet structures shall be revised by the respective responsible owners to comply with the above-defined goals within one (1) year of the enactment of this amendment.

K. Principal Outlets Quality Control.

- (1) Based upon the requirement limiting the size of the outlet to a minimum of six (6) inches in diameter, water quality control shall be maintained by providing an amount of storage equal to the NJDEP Water Quality Design Storm at the bottom of the proposed detention basin along with a minimum three-inch diameter outlet.
- (2) The invert(s) of the principal outlet(s) used to control the larger storms for flood control purposes should be set at the elevation of the water surface elevation required to produce the water quality storage volume. Therefore, the principal outlets would be utilized for storms in excess of the one and twenty-five-hundredths-inch, two-hour event which, in turn, would be completely controlled by the lower three (3) inch outlet. If the above requirements would result in a pipe smaller than three (3) inches in diameter, the period of retention shall be waived so that three (3) inches will be the minimum pipe size used. It should be remembered that, in all cases, the basin should be considered initially empty (i.e., the storage provided for the quality requirements and the discharge capacity of its outlet should be utilized during the routing of the larger flood control storms).

L. Emergency Spillways.

- (1) Vegetated emergency spillways shall have side slopes not exceeding three (3) horizontal to one (1) vertical.
- (2) Emergency spillways not excavated from noncompacted soil shall be suitably lined and shall comply with criteria contained in Standards for Soil Erosion and Sediment Control.
- (3) Maximum velocities in emergency spillways shall be checked based on the velocity of the peak flow in the spillway resulting from the routed emergency spillway hydrograph. Where maximum velocities exceed those contained in Standards for Soil Erosion and Sediment Control in New Jersey, suitable lining shall be provided.

M. Dams and Embankments

- (1) The minimum top widths of all dams and embankments are listed below. These values have been adopted from the Standards for Soil and Sediment Control in New Jersey, published by the New Jersey State Soil Conservation Committee.

<u>Minimum Top Widths for Dams & Embankments</u>	
<u>Height (feet)</u>	<u>Top Width (feet)</u>
<u>0-20</u>	<u>10</u>
<u>20-24</u>	<u>12</u>

- (2) The design top elevation of all dams and embankments after all settlement has taken place shall be equal to or greater than the maximum water surface elevation in the basin resulting from the routed freeboard hydrograph. Therefore, the design height of the dam or embankment, defined as the vertical distance from the top down to the bottom of the deepest cut, shall be increased by the amount needed to ensure the design top elevation will be maintained following all settlement. This increase shall not be less than five percent (5%). Where necessary, the Engineer shall require consolidation tests of the undisturbed foundation soil to more accurately determine the necessary increase.
 - (3) Maximum side slopes for all dams and embankments are three (3) horizontal to one (1) vertical.
 - (4) All earth fill shall be free from brush, roots and other organic material subject to decomposition.
 - (5) Cutoff trenches are to be excavated along the dam or embankment center line to impervious subsoil or bedrock.
 - (6) Safety ledges shall be constructed on the side slopes of all detention basins having a permanent pool of water. The ledges shall be four (4) to six (6) feet in width and located approximately two and one-half (2-1/2) to three (3) feet below and one (1) to one and one-half (1-1/2) feet above the permanent water surface.
 - (7) The fill material in all earth dams and embankments shall be compacted to at least ninety-five percent (95%) of the maximum density obtained from compaction tests performed by the appropriate method in ASTM D698.
 - (8) The top of bank for facilities constructed in cut and the toe of slope for facilities constructed in fill shall be located no closer than ten (10) feet to an existing or proposed property line.
 - (9) Detention basins shall be sodded, attractively buffered and landscaped and designed as to minimize propagation of insects, particularly mosquitoes. All landscaping and buffering shall be approved by the Township.
- N. Detention Facilities in Flood Hazard Areas. There will be no detention basins in the floodway except for those on-stream and shall comply with all applicable regulations under the Flood Hazard Control Act, N.J.S.A. 58:16A-50 et seq., and the New Jersey Stormwater Management Act, N.J.S.A. 40:55D-93 et seq.
- O. Detention facilities in freshwater wetlands. Detention basins located in freshwater wetlands may be allowed only in accordance with the Freshwater Wetlands Protection Act, N.J.S.A. 13:9B-1 et seq. and any rules adopted pursuant thereto.
- P. Detention Facilities; Maintenance and Repair.
- (I) Responsibility for operation and maintenance of detention 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 it 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, hereinafter in this section referred to as the "responsible person."

- (2) Prior to granting final approval to any project subject to review under this section, the applicant shall enter into an agreement with the municipality (or County) to ensure the continued operation and maintenance of the detention facility. This agreement shall be in a form satisfactory to Corporation Counsel and may include, but may not necessarily be limited to, personal guaranties, deed restrictions, covenants and bonds. In cases where property is subdivided and sold separately, a homeowners, association or similar permanent entity should be established as the responsible entity, absent an agreement by a governmental agency to assume responsibility.
- (a) An applicant seeking approval for construction of a detention facility shall provide the funds necessary to permanently maintain the facility. The amount necessary to permanently maintain the facility shall be calculated by the Planning Board Engineer based upon current estimates for maintenance with an annual increase of four percent (4%). The Planning Board Engineer shall also assume that the investment will yield a return equal to the ninety-day certificate of deposit interest rate paid by the Township fiduciary institution or its successor on the date the calculation is made.
- (b) The form of security for the maintenance of the facility shall be approved by Corporation Counsel.
- (3) In the event that the detention facility becomes a danger to public safety or public health or if it is in need of maintenance, the municipality shall so notify in writing the responsible person. From that notice, the responsible person shall have fourteen (14) days to effect such maintenance and repair of the facility in a manner that is approved by the Township Engineer or his designee. If the responsible person fails or refuses to perform such maintenance and repair, the municipality may proceed to do so and shall bid the cost thereof to the responsible person.

Q. Division of Coastal Resources.

- (1) All projects containing stream encroachments within the flood hazard area and one hundred-year floodplain, at locations having a drainage area of over fifty (50) acres and all projects of special concern, as defined in N.J.A.C. 7:13-5, are subject to the approval of NJDEP, Division of Coastal Resources.
- (2) All projects containing a drainage area over fifty (50) acres must establish the one hundred-year floodplain zone in accordance with N.J.A.C. 7:13-1.8.

R. For both major and minor subdivisions, blocks and lots shall be graded to secure proper drainage away from buildings and to prevent the collection of stormwater in pools.

S. For both major and minor subdivisions, land subject to periodic or occasional flooding (floodplain areas) shall not be plotted for residential occupancy nor for any other purpose which may endanger life or property or aggravate the flood hazard. Such land within a plat shall be considered for open spaces or other similar uses.

T. Prohibitions on the Discharge of Storm Drainage and Groundwater.

- (1) Stormwater, groundwater, rainwater, street drainage, subsurface drainage or yard drainage shall not be discharged through direct or indirect connections of a sump pump, cellar drain or any other means of conveyance into a community sanitary sewer owned or operated by the Township of Hillsborough.
- (2) Any person who is convicted of violating any provision of this section shall be fined not less than fifty (\$50.00) dollars for a first offense and not less than one hundred (\$100.00) dollars for each subsequent offense.

§ 262-5. 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 major development in accordance with § 262-12.
- 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 13:1B-15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergii* (bog turtle).
- C.** The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity and stormwater runoff quality requirements of § 262-5P, Q, and R:
 - (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.** Waivers.
 - (1)** A waiver from strict compliance from the green infrastructure, groundwater recharge, stormwater runoff quantity and stormwater runoff quality requirements of § 262-5O, P, Q, and R 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 strategies and measures, the option selected complies with the requirements of § 262-5O, P, Q, and R, to the maximum extent practicable;
 - (c)** The applicant demonstrates that, in order to meet the requirements of § 262-5O, P, Q, and R, 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 Subsection D(1)(c) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of § 262-5O, P, Q, and R that were not achievable on-site.
- E.** 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 § 262-5O, P, Q and R. 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.

- F. Where the BMP tables in the NJ Stormwater Management Rule are different due to updates or amendments with the tables in this article, 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 § 262-50(2).
- (b) Designed to infiltrate into the subsoil.
- (c) Designed with underdrains.
- (d) Designed to maintain at least a ten-foot-wide area of native vegetation along at least 50% 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 2%.
- (f) Designed with a slope of equal to or greater than 2%.
- (g) Manufactured treatment devices that meet the definition of "green infrastructure" in § 262-2.
- (h) Manufactured treatment devices that do not meet the definition of "green infrastructure" in § 262-2.

G. 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 § 262-5B. Alternative stormwater management measures may be used to satisfy the requirements at § 262-50 only if the measures meet the definition of "green infrastructure" in § 262-2. Alternative stormwater management measures that function in a similar manner to a BMP listed at § 262-50(2) are subject to the contributory drainage area limitation specified at § 262-50(2) 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 § 262-50(2) 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 § 262-5D is granted from § 262-50.

H. 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.

I. Design standards for stormwater management measures are as follows:

- (1) 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; and the presence of solution-prone carbonate rocks (limestone);
 - (2) Stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure, as appropriate, and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than 1/3 the width of the diameter of the orifice or 1/3 the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of § 262-10C;
 - (3) 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;
 - (4) Stormwater management BMPs shall be designed to meet the minimum safety standards for stormwater management BMPs in § 262-10; and
 - (5) The size of the orifice at the intake to the outlet from the stormwater management BMP shall be a minimum of 2 1/2 inches in diameter.
- J.** Manufactured treatment devices may be used to meet the requirements of this article, 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" in § 262-2 may be used only under the circumstances described in § 262-50(4).
- K.** Any application for a new agricultural development that meets the definition of "major development" in § 262-2 shall be submitted to the Soil Conservation District for review and approval in accordance with the requirements in § 262-50 through R 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.
- L.** If there is more than one drainage area, the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards in § 262-5P through R shall be met in each drainage area, unless the runoff from the drainage areas converge on-site 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.
- M.** 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 Somerset 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 § 262-50 through R 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 § 262-12B(5). 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.

N. 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 § 262-5 of this article 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 Somerset 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 Subsection M 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 Subsection M above.

O. 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 in § 262-5P and Q, the design engineer shall utilize green infrastructure BMPs identified in Table 1 in § 262-5F and/or an alternative stormwater management measure approved in accordance with § 262-5G. 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

- (3) To satisfy the stormwater runoff quantity standards in § 262-5R, the design engineer shall utilize BMPs from Table 1 or from Table 2 and/or an alternative stormwater management measure approved in accordance with § 262-5-G.
- (4) If a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance

with § 262-5D 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 § 262-5G may be used to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards in § 262-5P, Q and R.

- (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 in § 262-5P, Q, and R, unless the project is granted a waiver from strict compliance in accordance with § 262-5D.

P. Groundwater recharge standards.

- (1) This subsection contains the minimum design and performance standards for groundwater recharge as follows.
- (2) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations in § 262-7, either:
- (a) 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
 - (b) Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from preconstruction to post-construction for the two-year storm is infiltrated.
 - (c) Applications proposing the use of hydrologic soil groups other than those mapped on site by the NRCS County Soil Survey may not utilize option (a) above. Tested soil infiltration rates as low as 0.25 inches per hour will be accepted for recharge calculations. A factor of safety of 2 is to be applied to tested rates. Sites with tested infiltration rates below 0.25 inches per hour are to incorporate recharge using a BMP listed under § 262-5 Tables 1, 2, and 3.
- (3) This groundwater recharge requirement does not apply to projects within the urban redevelopment area, or to projects subject to Subsection P(4) below.
- (4) The following types of stormwater shall not be recharged:
- (a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with a Department-approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
 - (b) Industrial stormwater exposed to source material. "Source material" means any material(s)

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

Q. Stormwater runoff quality standards.

- (1) This subsection contains the minimum design and performance standards to control stormwater runoff quality impacts of major and non-major developments. ~~Stormwater runoff quality standards are applicable when the major development results in an increase of 1/4 acre or more of regulated motor vehicle surface.~~
- (2) 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:
 - (a) Eighty percent 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.
 - (b) If the surface is considered regulated motor vehicle surface because the water quality treatment for an area of motor vehicle surface that 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.
- (3) 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 an NJPDES permit from this requirement. Every major development, including any that discharge into a combined sewer system, shall comply with Subsection Q(2) above, unless the major development is itself subject to an 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.
- (4) 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	0.0049 8	43	0.1864	83	1.103 8
4	0.0066 4	44	0.1932	84	1.110 4
5	0.0083	45	0.2000	85	1.117 0
6	0.0099 6	46	0.2117	86	1.123 6
7	0.0116 2	47	0.2233	87	1.130 2
8	0.0132 8	48	0.2350	88	1.136 8
9	0.0149 4	49	0.2466	89	1.143 4
10	0.0166	50	0.2583	90	1.150 0
11	0.0182 8	51	0.2783	91	1.155 0
12	0.0199 6	52	0.2983	92	1.160 0
13	0.0216 4	53	0.3183	93	1.165 0
14	0.0233 2	54	0.3383	94	1.170 0
15	0.0250 0	55	0.3583	95	1.175 0
16	0.0300 0	56	0.4116	96	1.180 0
17	0.0350 0	57	0.4650	97	1.185 0
18	0.0400 0	58	0.5183	98	1.190 0
19	0.0450 0	59	0.5717	99	1.195 0
20	0.0500 0	60	0.6250	100	1.200 0
21	0.0550 0	61	0.6783	101	1.205 0
22	0.0600 0	62	0.7317	102	1.210 0
23	0.0650 0	63	0.7850	103	1.215 0
24	0.0700 0	64	0.8384	104	1.220 0
25	0.0750 0	65	0.8917	105	1.225 0

26	0.0800 0	66	0.9117	106	1.226 7
27	0.0850 0	67	0.9317	107	1.228 4
28	0.0900 0	68	0.9517	108	1.230 0
29	0.0950 0	69	0.9717	109	1.231 7
30	0.1000 0	70	0.9917	110	1.233 4
31	0.1066 0	71	1.0034	111	1.235 1
32	0.1132 0	72	1.0150	112	1.236 7
33	0.1198 0	73	1.0267	113	1.238 4
34	0.1264 0	74	1.0383	114	1.240 0
35	0.1330 0	75	1.0500	115	1.241 7
36	0.1396 0	76	1.0568	116	1.243 4
37	0.1462 0	77	1.0636	117	1.245 0
38	0.1528 0	78	1.0704	118	1.246 7
39	0.1594 0	79	1.0772	119	1.248 3
40	0.1660 0	80	1.0840	120	1.250 0

- (5) If more than one BMP in series is necessary to achieve the required 80% 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.

- (6) 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 § 262-5P, Q and R.

- (7) 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.
- (8) 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.
- (9) Pursuant to the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-11.2(j)3i, 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% of the anticipated load from the developed site, expressed as an annual average.
- (10) These 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.

R. Stormwater runoff quantity standards.

- (1) This subsection contains the minimum design and performance standards to control stormwater runoff quantity impacts of major development.
- (2) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at § 262-7, complete one of the following:
 - (a) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two-, ten-, and 100-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 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;
 - (c) Design stormwater management measures so that the post-construction peak runoff rates for the two-, ten- and 100-year storm events are 50%, 75% and 80%, respectively, of the preconstruction 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; or
 - (d) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsection R(2)(a), (b) and (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.

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

§ 262-6. Standards for Stormwater Structures

A. Construction Standards for Pipe

- (1) Materials used in the construction of storm sewers shall be constructed of reinforced concrete, ductile iron, corrugated aluminum or corrugated steel unless site and other conditions dictate otherwise. Reinforced concrete pipe shall be used unless the applicant can demonstrate that the use of other materials will be more beneficial due to the proposed installation. Cost will not be a consideration in this analysis. Specifications referred to, such as American Standards Association, American Society for Testing and Materials, American Water Works Association, etc., should be the latest revision.
 - (a) Reinforced Concrete Pipe.
 - [1] Circular reinforced concrete pipe and fittings shall meet the requirements of ASTM C-76.
 - [2] Elliptical reinforced concrete pipe shall meet the requirements of ASTM C-507.
 - [3] Joint design and joint material for circular pipe shall conform to ASTM C-443.
 - [4] Joints for elliptical pipe shall be bell and spigot or tongue and groove, sealed with butyl, rubber tape or external sealing bands conforming to ASTM C-877.
 - [5] All pipe shall be Class III unless a stronger pipe (i.e., higher class) is indicated to be necessary.
 - [6] The minimum depth of cover over the concrete pipe shall be as designated by the American Concrete Pipe Association.
 - (2) Ductile Iron Pipe. Ductile iron pipe shall be centrifugally cast in metal or sand-lined molds to ANSI A 21.51-1976 (AWWA C151-76). The joints shall conform to AWWA C111. Pipe shall be furnished with flanges where connections to flange fittings are required. Pipe should be Class 50 (minimum). The outside of the pipe should be coated with a uniform thickness of hot-applied coal tar coating and the inside line cement in accordance with AWWA C104. Ductile iron pipe shall be installed with Class C ordinary bedding.
 - (3) Corrugated Aluminum Pipe. Within the public right-of-way and where severe topographic conditions or the desire to minimize the destruction of trees and vegetation exist, corrugated aluminum pipe, pipe arch or helical corrugated pipe may be used. The material shall comply with the Standard Specifications for Corrugated Aluminum Alloy Culvert and Under Drain AASHTO destination M196 or the Standard Specification for Aluminum Alloy Helical Pipe AASHTO Designation M-211. The minimum thickness of the aluminum pipe to be used shall be:
 - (a) Less than twenty-four (24) inch diameter or equivalent, seventy-five thousandths (0.075) inch (14-gauge).
 - (b) Twenty-four-inch diameter and less than forty-eight-inch diameter or equivalent, one hundred five thousandths (0.105) inch (12-gauge).
 - (c) Forty-eight-inch but less than seventy-two-inch diameter or equivalent, one hundred thirty-five

thousandths (0.135) inch (10-gauge).

- (d) Seventy-two-inch diameter or equivalent and larger, one hundred sixty-four thousandths (0.164) inch (8-gauge).
- (e) Corrugated Steel Pipe. Corrugated steel pipe may be used in place of corrugated aluminum and shall meet the requirements of AASHTO Specification M36. Coupling bands and special sections shall also conform to AASHTO M-36. All corrugated steel pipe shall be bituminous coated in accordance with AASHTO M-190 Type A minimum.
- (f) Pipe bedding shall be provided as specified in Design and Construction of Sanitary and Storm Sewers, ASCE Manuals and Reports on Engineering Practice Number 37, prepared by A Joint Committee of the Society of Civil Engineers and the Water Pollution Control Federation, New York, 1969.

B. Construction Standards for Inlets, Catch Basins and Manholes. Inlets, catch basins and manholes shall be designed in accordance with State Highway Department Standard Plans and Specifications. Frames shall be Campbell Foundry Company Pattern Number 2541, 2548, with eight-inch curb face, and 3432, 3440, for Type E inlets, or approved equal. All grates shall be bicycle grates.

- (1) Manholes and catch basins shall be precast concrete, brick or concrete block, coated with two (2) coats of portland cement mortar.
- (2) If precast manhole barrels and cones are used, they shall conform to ASTM Specification C-473 with round rubber gasketed joints, conforming to ASTM Specification C-923. Maximum absorption shall be eight percent (8%) in accordance with ASTM Specification C-478, Method A.
- (3) If precast manholes are utilized, the top riser section shall terminate less than one (1) foot below the finished grade and the manhole cover shall be flush with the finished grade.
- (4) Manhole frames and covers shall be of cast iron conforming to ASTM Specification A-48 Class 30 and be suitable for H-20 loading capacity. All manhole covers in rights-of-way or in remote areas shall be provided with a locking device. The letters "Year 20 ___" and the words "STORM SEWER" shall be cast integrally in the cover.

§ 262-7. Calculation of stormwater runoff and groundwater recharge.

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

- (1) The design engineer shall calculate runoff using one of the following methods:
 - (a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in 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
 - (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. The 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 "curve number" applies to both the NRCS methodology at § 262-7A(1)(a). A curve number 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 has 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.

B. Groundwater recharge may be calculated in accordance with the following: the New Jersey Geological Survey Report GSR-32 A, Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual, at the New Jersey Geological Survey website at: <https://www.nj.gov/dep/njgs/pricelst/greport/gsr32.pdf> or at New Jersey Geological and Water Survey, 29 Arctic Parkway, P.O. Box 420, Mail Code 29-01, Trenton, New Jersey 08625-0420.

C. The precipitation depths of the current two-, 10-, and 100-year storm events shall be determined by multiplying the values determined in accordance with items 1 and 2 below:

- (1) The applicant shall utilize the National Oceanographic and Atmospheric Administration (NOAA), National Weather Service's Atlas 14 Point Precipitation Frequency Estimates: NJ, in accordance with the location(s) of the drainage area(s) of the site. This data is available at: https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=nj; and

- (2) The applicant shall utilize Table 5: Current Precipitation Adjustment Factors below, which sets forth the applicable multiplier for the drainage area(s) of the site, in accordance with the county where the drainage area(s) of the site is located.

Table 5: Current Precipitation Adjustment Factors

County	Current Precipitation Adjustment Factors		
	2-year Design Storm	10-year Design Storm	100-year Design Storm
Somerset	1.00	1.03	1.09

- D. Table 6: Future Precipitation Change Factors provided below sets forth the change factors to be used in determining the projected two-, 10-, and 100-year storm events for use in this chapter, which are organized alphabetically by county. The precipitation depth of the projected two-, 10-, and 100-year storm events of a site shall be determined by multiplying the precipitation depth of the two-, 10-, and 100-year storm events determined from the National Weather Service’s Atlas 14 Point Precipitation Frequency Estimates pursuant to (c)1 above, by the change factor in the table below, in accordance with the county where the drainage area(s) of the site is located, or the most recent published information from the NJDEP.

Table 6: Future Precipitation Change Factors

County	Future Precipitation Change Factors		
	2-year Design Storm	10-year Design Storm	10-year Design Storm
Somerset	1.19	1.24	1.48

§ 262-8. Sources for technical guidance.

- A. Technical guidance for stormwater management measures can be found in the documents listed at Subsection A(1) and (2) below, which are available to download from the Department's website at: https://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 and supplemented. Information is provided on stormwater management measures such as, but not limited to, those listed in Tables 1, 2, and 3.
- (2) Additional maintenance guidance is available on the Department's website at: https://www.njstormwater.org/maintenance_guidance.htm.
- B. 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.

§ 262-9. Solids and floatable materials control standards. [Added 2-23-2021 by Ord. No. 2021-01³]

- A. Site design features identified under § 262-5F above, or alternative designs in accordance § 262-5G 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 section, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see § 262-9A(2) below.

(1) 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:

- (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 7.0 square inches, or is no greater than 0.5 inch 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.

- (c) 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 7.0 square inches, or be no greater than 2.0 inches across the smallest dimension.

(2) The standard in Subsection A(1) above does not apply:

- (a) Where each individual clear space in the curb opening in the existing curb-opening inlet does not have an area of more than 9.0 square inches;
- (b) 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;
- (c) 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:
 - [1] A rectangular space 4.625 inches long and 1.5 inches wide (this option does not apply for outfall netting facilities); or
 - [2] A bar screen having a bar spacing of 0.5 inch.

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 5:21-7.4(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 N.J.A.C. 7:8; 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

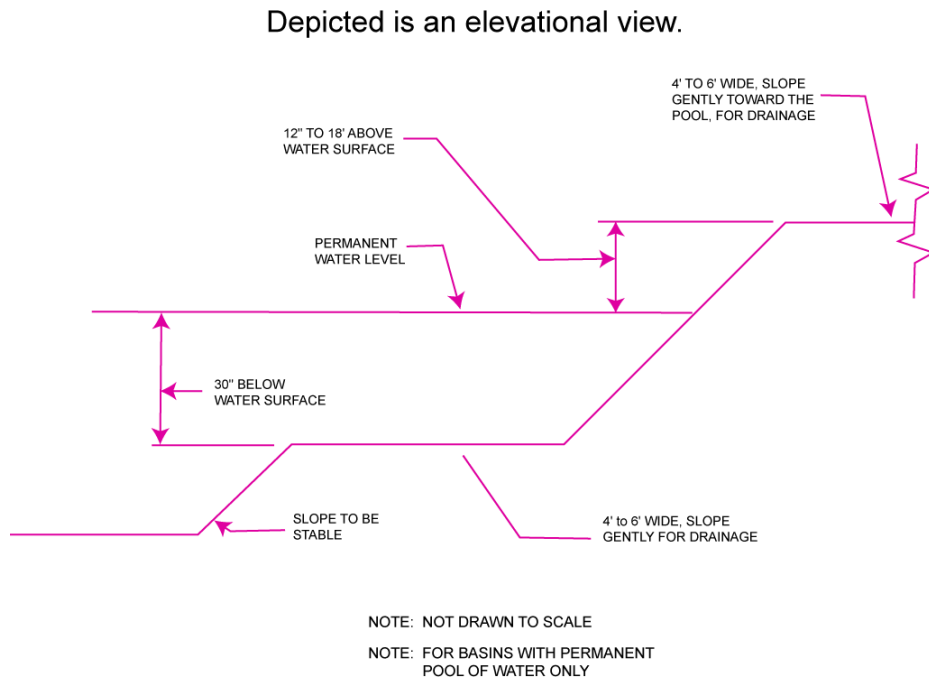
standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

§ 262-10. Safety standards for stormwater management basins.

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management BMP.
- B. 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 § 262-10C(1) through (3) for trash racks, overflow grates, and escape provisions at outlet structures.
- C. 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 Subsection B(3), "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 BMPs shall include escape provisions as follows:
 - (a) If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency pursuant to § 262-10C, a freestanding outlet structure may be exempted from this requirement.
 - (b) Safety ledges shall be constructed on the slopes of all new stormwater management BMPs having a permanent pool of water deeper than 2 1/2 feet. Such safety ledges shall be comprised of two steps. Each step shall be four feet to six feet in width. One step shall be located approximately 2

1/2 feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See § 262-10E for an illustration of safety ledges in a stormwater management basin.

- (c) 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.
- D. Variance or exemption from safety standards. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, County or Department) that the variance or exemption will not constitute a threat to public safety.
- E. Safety ledge illustration.



§ 262-11. Requirements for a site development stormwater plan.

- A. Submission of site development stormwater plan.
 - (1) Whenever an applicant seeks municipal approval of a development subject to this article, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at § 262-11C 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 article.
 - (3) The applicant shall submit 16 copies of the materials listed in the checklist for site development stormwater plans in accordance with § 262-11C of this article.
- 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 municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning 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

article.

C. Checklist requirements. The following information shall be required:

- (1) Topographic base map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of one inch equals 200 feet or greater, showing two-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams 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 §§ 262-3 through 262-8 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 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. [Amended 3-8-2022 by Ord. No. 2022-01]
 - (b) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.
- (6) Calculations.
 - (a) Comprehensive hydrologic and hydraulic design calculations for the predevelopment and post development conditions for the design storms specified in § 262-5 of this article.
 - (b) When the proposed stormwater management control measures (e.g., infiltration basins) depends on the hydrologic properties of soils, then a soils report shall be submitted. The

soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

- (7) Maintenance and repair plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of § 262-12.
- (8) Waiver from submission requirements. The municipal official or board reviewing an application under this article may, in consultation with the municipal engineer, waive submission of any of the requirements in § 262-11C(1) through (6) of this article when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

§ 262-12. Maintenance and repair.

- A. Applicability. Projects subject to review as in § 262-1C of this article shall comply with the requirements of § 262-12B and C.
- B. General maintenance. [Amended 2-23-2021 by Ord. No. 2021-01]
 - (1) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
 - (2) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris or trash removal; and the name, address and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). 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.
 - (3) 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.
 - (4) Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project unless such owner or tenant owns or leases the entire residential development or project. [Amended 3-8-2022 by Ord. No. 2022-01]
 - (5) If the person responsible for maintenance identified under § 262-12B(3) above is not a public agency, the maintenance plan and any future revisions based on § 262-12B(7) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
 - (6) Preventative and corrective maintenance shall be performed to maintain the functional parameters (storage volume, infiltration rates, inflow/outflow capacity, etc.) of the stormwater management measures, including repairs or replacement to the structure; removal of sediment, debris or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
 - (7) The party responsible for maintenance identified under § 262-12B(3) above shall perform all of

the following requirements:

- (a) 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;
 - (b) Evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed; and
 - (c) 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 § 262-12B(6) and (7) above.
 - (8) The requirements of § 262-12B(3) and (4) 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.
 - (9) In the event that the stormwater management facility becomes a danger to public safety or public health or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or county may immediately proceed to do so and shall bill the cost thereof to the responsible person.
- C. Nothing in this section shall preclude 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.
- D. Maintenance of detention/retention/recharge basins. [Added 2-22-2011 by Ord. No. 2011-04; amended 11-22-2011 by Ord. No. 2011-19]
- (1) All detention/retention basins for stormwater drainage, and recharge basins for water quality, also known as stormwater facilities:
 - (a) In any multifamily residential development or nonresidential development, shall be owned and maintained by a condominium homeowners' association or other private entity; and
 - (b) In or as a part of a solely single-family residential development, shall be:
 - [1] Owned and maintained by a homeowners' association or other private entity, until and unless specifically accepted by the Township of Hillsborough for compelling reasons of public health, safety or welfare; and
 - [2] Situated on a lot or lots that are separate from any lots that contain single- family dwellings.
 - (2) Prior to the issuance to a developer of any certificate of occupancy and prior to the acceptance by the Township of any existing basin, for compelling reasons of public health, safety, and welfare, from a homeowners' association or other private entity:
 - (a) The stormwater facility shall be certified by the Township Engineer to have been constructed in accordance with the requirements and specifications of this section, with any deficiencies thus noted to be corrected by the developer, homeowners' association or other private entity currently holding ownership; and

shall be based upon a one-hour mobilization time together with the total number of hours expended times the rate per hour for Township labor and equipment.

- [4] Long-term maintenance of detention/retention/recharge basins. The long-term maintenance shall be calculated on a cost per acre and applied against the assumption that a residential detention/retention basin needs rejuvenation every 15 years. These amounts are reduced thereto an annualized cost.
 - [5] Insurance of detention/retention/recharge basins. The Township or homeowners' association or other private entity, as appropriate, shall assume liability for the property, and a portion of the fund shall be used for purchase of insurance for the detention/retention basin.
- (e) Calculation of the maintenance fund of detention/retention/recharge basins. The amount of money to be placed in escrow shall be calculated in accordance with the worksheet set forth in Schedule A. The first-year costs are multiplied by the factor of 26.48. Said calculation provides for the Township or homeowners' association or other private entity, as appropriate, to receive sufficient funding for 25 years based upon an assumption of a six-percent increase per year and one-half percent return on investment earnings added to the account. The cost for the maintenance by the Township employees shall be based upon the amount of time services are performed and the unit (i.e., per diem or hourly fee) of the professional, expert, employee or staff member in accordance with the contracts or as prescribed by the salary ordinance of the Township of Hillsborough.

§ 262-13. Violations and penalties.

Any person who erects, constructs, alters, repairs, converts, maintains or uses any building, structure or land in violation of this article shall be subject to the following penalties: imprisonment in the Somerset County Jail or in any place provided by the Township of the detention of prisoners, for any term not exceeding 90 days; or by a fine not exceeding \$1,250; or by a period of community service not exceeding 90 days.

§ 262-14. When effective.

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

§ 262-15. Severability.

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

Section 2. This Ordinance shall be construed so as not to conflict with any provision of New Jersey or Federal law. The provisions of this Ordinance shall be cumulative with, and not in substitution for, all other applicable zoning, planning, and land use regulations. In the event of any inconsistency or conflict between the provisions of this Ordinance or other local requirements, the provisions of this Ordinance shall apply.

Section 3 If any provisions of this Ordinance shall be adjudged invalid, such adjudication shall not affect the validity of the remaining provisions which shall be deemed severable therefrom.

Section 4. After introduction, the Township Clerk is hereby directed to provide a copy of the within Ordinance to the Planning Board for its review in accordance with N.J.S.A. 40:55D-26 and N.J.S.A.40:55D-

64. The Planning Board is directed to make and transmit to the Township Committee within 35 days after referral a report, including identification of any provisions in the proposed Ordinance which are inconsistent with the Master Plan and recommendations concerning any inconsistencies and any other matter as the Board deems appropriate.

Section 5. After introduction, the Township Clerk is hereby directed to provide by personal service, certified mail or email with confirmation that the email was delivered, at least 10 days prior to the scheduled hearing, a copy of this Ordinance and a Notice of Hearing in accordance with N.J.S.A. 40:55D-15 to: the clerk of any adjoining municipalities located within 200 feet of the boundaries of the affected properties; and the County Planning Board.

Section 6. After introduction, the Township Clerk, in accordance with N.J.S.A. 40:49-2 and N.J.S.A. 40:49-2.1, is hereby directed to publish this Ordinance in its entirety or by title and summary at least once in a newspaper published and circulated in the municipality, if there is one, and if not, in a newspaper printed in the county and circulating in the municipality, together with a notice of the introduction thereof, the time and place when and where it will be further considered for final passage. The publication shall include a clear and concise statement prepared by the Clerk setting forth the purpose of this Ordinance and a time and place when and where a copy of this Ordinance can be obtained without cost by any member of the general public. The publication shall be at least one week prior to the scheduled hearing.

Section 7. If adopted, the Township Clerk, in accordance with N.J.S.A. 40:49-2 and N.J.S.A. 40:49-2.1, is hereby directed to publish this Ordinance, in its entirety or by title and summary, together with a notice of the date of passage or approval, at least once in a newspaper published and circulated in the municipality, if there is one, and if not, in a newspaper printed in the county and circulating in the municipality.

Section 8. If adopted, the Township Clerk, in accordance with N.J.S.A. 40:55D-16, shall forward a copy of this Ordinance to the County Planning Board for filing.

Section 9. This Ordinance shall take effect immediately upon its adoption, passage and publication according to law.

ATTEST:

TOWNSHIP OF HILLSBOROUGH:

Sarah Brake, Township Clerk

Robert Britting Jr., Mayor

Introduced:

Published:

Public Hearing:

Adopted:

Published: