

CHAPTER XXVI STORMWATER MANAGEMENT

26-1 SCOPE AND PURPOSE.

26-1.1 Purpose.

a. It is hereby determined that:

1. Land development projects and associated disturbance of vegetation and soil and changes in land cover, including increases in impervious cover, alter the hydrologic response of local watersheds and increase stormwater runoff rates and volumes. If inadequately or improperly managed, this stormwater runoff can deplete groundwater resources and increase flooding, stream channel erosion, and sediment transport and deposition in the Borough of Pitman.

2. This stormwater runoff contributes to increased quantities of waterborne pollutants.

3. Increases of stormwater runoff, soil erosion and nonpoint source pollutants have occurred in the past as a result of land development, and contribute to the degradation of the water resources of the Borough of Pitman.

4. The Borough of Pitman's natural resources are to be protected in accordance with New Jersey's Stormwater Management Rules at N.J.A.C. 7:8-1.1 et seq. and New Jersey's surface water quality anti-degradation policies contained in the New Jersey Surface Water Quality Standards at N.J.A.C. 7:96-1.1 et seq. Permitted uses shall maintain the ecological character and quality of the Borough of Pitman, including good water quality and natural rates and volumes of flow.

5. Increased stormwater rates and volumes and the sediments and pollutants associated with stormwater runoff from future development projects within the Borough of Pitman have the potential to adversely affect the Borough of Pitman's streams and water resources and the streams and water resources of downstream municipalities.

6. Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized through the regulation of stormwater runoff from development sites.

7. It is in the public interest to regulate the discharge of stormwater runoff from "major development" projects, as defined in Section 26-7, conducted within the Borough of Pitman, as provided in this chapter, in order to control and minimize increases in stormwater runoff rates and volumes, to maintain groundwater recharge, and to control and minimize soil erosion, stream channel erosion and nonpoint source pollution associated with stormwater runoff.

b. Therefore, it is the purpose of this chapter to establish minimum stormwater management requirements and controls for major development, consistent with the statewide

stormwater requirements at N.J.A.C. 7:8-1 and the provisions of the adopted master plan and land use ordinances of the Borough of Pitman.
(Ord. No. 08-6 § 1A)

26-1.2 Goals and Techniques.

a. Through this chapter, the Borough of Pitman has established the following goals for stormwater control:

1. To reduce flood damage, including damage to life and property;
2. To minimize any increase in stormwater runoff from new development;
3. To reduce soil erosion from any development or construction project;
4. To assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
5. To maintain groundwater recharge;
6. To minimize any increase in nonpoint pollution;
7. To maintain the integrity of stream channels for their biological functions, as well as for drainage;
8. To restore, protect, maintain and enhance the quality of the streams and water resources and the ecological character and quality of the Borough of Pitman ;
9. To minimize pollutants in stormwater runoff from new and existing development in order to restore, protect, enhance and maintain the chemical, physical and biological integrity of the surface and groundwaters of the Borough of Pitman, to protect public health and to enhance the domestic, municipal, recreational, industrial and other uses of water; and
10. To protect public safety through the proper design and operation of stormwater management basins.

b. In order to achieve the goals for stormwater control set forth in this chapter, the Borough of Pitman has identified the following management techniques:

1. Implementation of multiple stormwater management Best Management Practices (BMPs) may be necessary to achieve the performance standards for stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality established through this chapter.
2. Compliance with the stormwater runoff quantity and rate, groundwater recharge, erosion control, and stormwater runoff quality standards established through N.J.A.C. 7:8-1.1 et seq., and this chapter, shall be accomplished to the maximum extent practicable through the use of nonstructural BMPs, before relying on structural BMPs. Nonstructural BMPs are also known as Low Impact Development (LID) techniques.

3. Nonstructural BMPs shall include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater.

4. Source control plans shall be developed based upon physical site conditions and the origin, nature and the anticipated quantity or amount of potential pollutants.

5. Structural BMPs, where necessary shall be integrated with nonstructural stormwater management strategies and proper maintenance plans.

6. When using structural BMPs, multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, shall be used wherever possible to achieve the performance standards for water quality, quantity and groundwater recharge established through this chapter before relying on a single, larger stormwater management measure to achieve these performance standards.

(Ord. No. 08-6 § 1B)

26-1.3 Applicability.

a. This chapter shall apply to:

1. All site plans and subdivisions for major developments occurring within the Borough of Pitman that require preliminary or final site plan or subdivision review; and

2. All major development projects undertaken by the Borough of Pitman shall comply with this chapter. (This clause is intended to provide consistency with the NJDEP's stormwater management requirements.)

(Ord. No. 08-6 § 1C)

26-1.4 Procedures.

In addition to other development review procedures set forth in the Code of the Borough of Pitman, major developments located within the Borough of Pitman shall comply with the stormwater management requirements and specifications set forth in this chapter. New agricultural development that meets the definition of major development in Section 26-7 shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of N.J.A.C. 5.4(b) 7:8. (Ord. No. 08-6 § 1D)

26-1.5 Compatibility with Other Permit and Ordinance Requirements.

a. Development approvals issued for subdivisions and site plans pursuant to this chapter are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable ordinance, code, rule, regulation, statute, act or other provision of law.

b. In their interpretation and application, the provisions of this chapter shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This chapter is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this chapter

imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive or stringent provisions or higher standards shall control.

c. In the event that a regional stormwater management plan(s) is prepared and formally adopted pursuant to N.J.A.C. 7:8-1.1 et seq. for any drainage area(s) or watershed(s) of which the Borough of Pitman is a part, the stormwater provisions of such a plan(s) shall be adopted by the Borough of Pitman within one year of the adoption of a Regional Stormwater Management Plan (RSWMP) as an amendment to an Areawide Water Quality Management Plan.
(Ord. No. 08-6 § 1E)

26-2 REQUIREMENTS FOR A SITE DEVELOPMENT STORMWATER PLAN.

26-2.1 Submission of Site Development Stormwater Plan.

A. Whenever an applicant seeks municipal approval of a site development that is subject to this chapter, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 26-2.3 below as part of the applicant's application for subdivision or site plan approval. These required components are in addition to any other information required under any provisions of the Borough of Pitman's land use ordinance.

B. The applicant shall demonstrate that the site development project meets the standards set forth in this chapter.

C. The applicant shall submit three (3) copies of the materials listed in the checklist for site development stormwater plans in accordance with subsection 26-3.3.
(Ord. No. 08-6 § 2A)

26-2.2 Site Development Stormwater Plan Approval.

a. The applicant's site development stormwater plan shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from whom municipal approval is sought. That municipal board or official shall consult the engineer retained by the 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 chapter.
(Ord. No. 08-6 § 2B)

26-2.3 Checklist Requirements.

Any application for approval of a major development shall include at least the following information. All required engineering plans, and all other documents shall be submitted in paper, and the Planning Board may, by resolution adopted from time to time, require that same to be submitted in electronic computer software file formats upon media designated by it. Engineering plans shall also be registered and rectified to NJ State Plane Feet NAD 83 or Shape Format NJ State Plan Feet NAD 83. Fifteen (15) copies of each item shall be submitted.

a. *Topographic Base Map.* The applicant shall submit a topographic base map of the site which extends a minimum of two hundred (200) feet beyond the limits of the proposed

development, at a scale of one (1) inch = two hundred (200) feet or greater, showing one (1) foot contour intervals. The map shall indicate the following: existing surface water drainage, shorelines, steep slopes, soils, highly erodible soils, perennial or intermittent streams that drain into or upstream of any Category One Waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing surface and subsurface human-made structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown. The Borough of Pitman may require upstream tributary drainage system information as necessary.

b. *Environmental Site Analysis.* The applicant shall submit a written description along with the drawings of the natural and human-made features of the site and its environs. This description should include:

1. A discussion of environmentally critical areas, 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 for or constraints on development; and

2. Detailed soil and other environmental conditions on the portion of the site proposed for installation of any stormwater BMPs, including, at a minimum: soils report based on on-site soil tests; locations and spot elevations in plan view of test pits and permeability tests; permeability test data and calculations; and any other required soil data (e.g., mounding analyses results) correlated with location and elevation of each test site; cross-section of proposed stormwater BMP with side-by-side depiction of soil profile drawn to scale and seasonal high water table elevation identified; and any other information necessary to demonstrate the suitability of the specific proposed structural and nonstructural stormwater management measures relative to the environmental conditions on the portion(s) of the site proposed for implementation of those measures.

c. *Project Description and Site Plan(s).* The applicant shall submit a map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations will occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification for proposed changes in natural conditions shall also be provided.

d. *Land Use Planning and Source Control Plan.*

1. The applicant shall submit a detailed Land Use Planning and Source Control Plan which provides a description of how the site will be developed to meet the erosion control, groundwater recharge and stormwater runoff quantity and quality standards at Section 26-4 through use of nonstructural or low impact development techniques and source controls to the maximum extent practicable before relying on structural BMPs. The Land Use Planning and Source Control Plan shall include a detailed narrative and associated illustrative maps and/or plans that specifically address how each of the following nine (9) nonstructural strategies identified in Subchapter 5 of the NJDEP Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth below at paragraphs (a) through (i) will be implemented to the

maximum extent practicable to meet the standards at Section 26-4 on the site. If one or more of the nine (9) nonstructural strategies will not be implemented on the site, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practicable on the site.

(a) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

(b) Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

(c) Maximize the protection of natural drainage features and vegetation;

(d) Minimize the decrease in the pre-development "time of concentration";

(e) Minimize land disturbance including clearing and grading;

(f) Minimize soil compaction and all other soil disturbance;

(g) Provide low-maintenance landscaping that provides for the retention and planting of native plants and minimizes the use of lawns, fertilizers and pesticides;

(h) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and

(i) Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls shall include, but are not limited to:

(1) Site design features that help to prevent accumulation of trash and debris in drainage systems;

(2) Site design features that help to prevent discharge of trash and debris from drainage systems;

(3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

(4) Applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules, when establishing vegetation after land disturbance.

2. For sites where stormwater will be generated from "high pollutant loading areas" or where stormwater will be exposed to "source material," as defined in Section 26-7 of this chapter, the applicant shall also demonstrate in the Land Use Planning and Source Control Plan that the requirements of Section 26-4 have been met.

3. The use of nonstructural strategies to meet the performance standards in Section 26-4 of this chapter is not required for development sites creating less than one (1) acre of disturbance. However, each application for major development and any other application where the Borough of Pitman otherwise requires a landscaping plan shall contain a

landscaping or revegetation plan. In addition, the applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Borough of Pitman Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval.

e. *Stormwater Management Facilities Map.* The applicant shall submit a map, at the same scale as the topographic base map, depicting the following information:

(a) The total area to be disturbed, paved and/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 manage and dispose of stormwater; and

(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 (if applicable) and emergency spillway provisions with maximum discharge capacity of each spillway.

f. *Calculations (Groundwater Recharge and Stormwater Runoff Rate, Volume and Quality).* The applicant shall submit comprehensive hydrologic and hydraulic design calculations for the predevelopment and post-development conditions for the design storms specified in Section 26-3. The standards for groundwater recharge and stormwater runoff rate, volume and quality required by Section 26-4 shall be met using the methods, calculations and assumptions provided in Section 26-3.

g. *Inspection, Maintenance and Repair Plan.* The applicant shall submit a detailed plan describing how the proposed stormwater management measure(s) shall meet the maintenance and repair requirements of Section 26-6. Said plan shall include, at a minimum, the following elements;

1. The frequency with which inspections will be made;
2. The specific maintenance tasks and requirements for each proposed structural and nonstructural BMP;
3. The name, address and telephone number for the entity responsible for implementation of the maintenance plan;
4. The reporting requirements; and
5. Copies of the inspection and maintenance reporting sheets.

h. *Exception from Submission Requirements.* An exception may be granted from submission of any of these required components (paragraph g. above, Inspection, Maintenance, and Repair Plan) if its absence will not materially affect the review process.
(Ord. No. 08-6 § 2C)

26-3 METHODOLOGIES FOR THE CALCULATION OF STORMWATER RUNOFF RATE AND VOLUME, STORMWATER RUNOFF QUALITY, AND GROUNDWATER RECHARGE.

26-3.1 Method of Calculating Stormwater Runoff Rate and Volume.

a. In complying with the Stormwater Runoff Quantity and Rate Standards in subsection 26-4.2, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 — Hydrology and Technical Release 55 — Urban Hydrology for Small Watersheds as amended and supplemented or the Rational Method for peak flow and the Modified Rational Method for hydrograph computations.

b. In calculating stormwater runoff using the NRCS methodology, the design engineer shall separately calculate and then combine the runoff volumes from pervious and directly connected impervious surfaces within each drainage area within the parcel.

c. Calculation of stormwater runoff from unconnected impervious surfaces shall be based, as applicable, upon the Two-Step method described in the current New Jersey Stormwater Best Management Practices Manual or the NRCS methodology.

d. In calculating stormwater runoff using the NRCS methodology, the design engineer shall use appropriate 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

e. When calculating stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:

1. When selecting or calculating Runoff Curve Numbers (CNs) for pre-developed project site conditions, the project site's land cover shall be assumed to be woods in good condition. However, another land cover may be used to calculate runoff coefficients if:

(a) Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and

(b) The design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records.

2. If more than one land cover has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations.

3. All pre-developed land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

4. In calculating pre-developed site stormwater runoff, the design engineer shall include the effects of all land features and structures, such as ponds, wetlands, depressions,

hedgerows, and culverts, which affect pre-developed site stormwater runoff rates and/or volumes.

5. Where tailwater will affect the hydraulic performance of a stormwater management measure, the design engineer shall include such effects in the measure's design. (Ord. No. 08-6 § 3A)

26-3.2 Method of Calculating Stormwater Runoff Quality.

a. In complying with the Stormwater Runoff Quality Standards in subsection 26-4.5a, the design engineer shall calculate the stormwater runoff rate and volume using the USDA Natural Resources Conservation Service (NRCS) Runoff Equation, Runoff Curve Numbers, and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Part 630 - Hydrology and Technical Release 55 - Urban Hydrology for Small Watersheds, as amended and supplemented or the Rational Method for peak flow and the Modified Rational Method for hydrograph computations, so long as the Delmarva hydrograph is employed.

b. The design engineer shall also use the NJDEP Water Quality Design Storm, which is one and one-quarter (1.25) inches of rainfall falling in a nonlinear pattern in two (2) hours. Details of the Water Quality Design Storm are shown in Table 1.

c. Calculation of runoff volumes, peak rates, and hydrographs for the Water Quality Design Storm may take into account the implementation of nonstructural and structural stormwater management measures.

Table 1 Water Quality Design Storm Distribution (See N.J.A.C. 7:8-5.5(a))			
Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417

55	0.3583	120	1.2500
60	0.6250		

d. *Total Suspended Solids (TSS) Reduction Calculations.*

1. If more than one stormwater BMP in series is necessary to achieve the required eighty (80%) percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (A \times B) / 100, \text{ where:}$$

R = total TSS percent load removal from application of both BMPs;

A = the TSS percent removal rate applicable to the first BMP; and

B = the TSS percent removal rate applicable to the second BMP.

2. If there is more than one on-site drainage area, the eighty (80%) percent TSS removal rate shall apply to each drainage area, unless the runoff from the sub areas converge on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.

e. *TSS Removal Rates for Stormwater BMPs.*

1. For purposes of TSS reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. The BMP Manual may be obtained from the address identified in Section 26-13 or found on the NJDEP's website at www.njstormwater.org. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2.

2. Alternative stormwater management measures, removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the Borough of Pitman. Any alternative stormwater management measure, removal rate or method of calculating the removal rate shall be subject to approval by the Borough of Pitman and a copy shall be provided to the following:

(a) The Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, NJ, 08625-0418.

Table 2: Pollutant Removal Rates for BMPs (See 7:8-5.5(c) and New Jersey BMP Manual Chapter 4)			
Best Management Practice	TSS Percent Removal Rate	Total Phosphorus Percent Removal Rate	Total Nitrogen Percent Removal Rate
Bioretention Systems	90	60	30

Constructed Stormwater Wetland	90	50	30
Extended Detention Basin	40-60 (final rate based upon detention time; see New Jersey BMP Manual, Chap. 9)	20	20
Infiltration basin	80	60	50
Manufactured Treatment Device	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.	Pollutant removal rates as certified by NJDEP; see Section III.
Pervious Paving Systems	80 (porous paving)	60	50
	80 (permeable pavers with storage bed)		
	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)	0 - volume reduction only (permeable pavers without storage bed)
Sand Filter	80	50	35
Vegetative Filter Strip (For filter strips with multiple vegetated covers, the final TSS removal rate should be based upon a weighted average of the adopted rates shown in Table 2, based upon the relative flow lengths through each cover type.)	60 (turf grass)	30	30
	70 (native grasses, meadow and planted woods)		
	80 (indigenous woods)		
Wet Pond / Retention Basin	50-90 (final rate based upon pool volume and detention time; see NJ BMP Manual)	50	30

f. Nutrient removal rates for stormwater BMPs. For purposes of post-development nutrient load reduction calculations, Table 2 presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey BMP Manual. If alternative stormwater BMPs are proposed, the applicant shall demonstrate that the selected BMPs will achieve the nutrient removal standard required in subsection 26-4.5.
(Ord. No. 08-6 § 3B)

26-3.3 Methods of Calculating Groundwater Recharge.

a. If complying with the groundwater recharge standards contained in subsection 26-4.3a.1, the design engineer may calculate groundwater recharge in accordance with the New Jersey Groundwater Recharge Spreadsheet (NJGRS) computer program incorporated herein by reference as amended and supplemented. Information regarding the methodology is available in Section 26-12 or from the New Jersey BMP Manual.

b. Alternative groundwater recharge calculation methods to meet these requirements may be used upon approval by the municipal engineer.

c. If complying with the groundwater recharge standards contained in subsection 26-4.3a.2, the design engineer shall:

1. Calculate stormwater runoff volumes in accordance with the USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Runoff Curve Numbers, as described in the NRCS National Engineering Handbook Part 630 — Hydrology and Technical Release 55 — Urban Hydrology for Small Watersheds as amended and supplemented; and

2. Use appropriate 2-year, 24-hour rainfall depths as developed for the project site by the National Oceanic and Atmospheric Administration, available online at <http://hdsc.nws.noaa.gov/hdsc/pfds/index.html>.

d. When calculating groundwater recharge or stormwater runoff for pre-developed site conditions, the design engineer shall use the following criteria:

1. When selecting land covers or calculating Runoff Curve Numbers (CNs) for predeveloped project site conditions, the project site's land cover shall be assumed to be woods. However, another land cover may be used to calculate runoff coefficients if:

- (a) Such land cover has existed at the site or portion thereof without interruption for at least five (5) years immediately prior to the time of application; and

- (b) The design engineer can document the character and extent of such land cover through the use of photographs, affidavits, and/or other acceptable land use records.

2. If more than one land cover, other than woods, has existed on the site during the five (5) years immediately prior to the time of application, the land cover with the lowest runoff potential (including woods) shall be used for the computations.

3. All predeveloped land covers shall be assumed to be in good hydrologic condition and, if cultivated, shall be assumed to have conservation treatment.

(Ord. No. 08-6 § 3C)

26-4 STORMWATER MANAGEMENT PERFORMANCE STANDARDS FOR MAJOR DEVELOPMENT.

26-4.1 Nonstructural Stormwater Management Strategies.

a. To the maximum extent practicable, the performance standards in Section 26-4 for major development shall be met by incorporating the nine (9) nonstructural strategies identified in Subchapter 5 of the NJ Stormwater Management Rules (N.J.A.C. 7:8-5), and set forth in subsection 26-2.3d,1, into the design. The applicant shall identify within the Land Use Planning and Source Control Plan required by subsection 26-2.3d how each of the nine (9) nonstructural measures will be incorporated into the design of the project to the maximum extent practicable.

b. If the applicant contends that it is not practical for engineering, environmental or safety reasons to incorporate any of the nine (9) nonstructural strategies into the design of a particular project, the applicant shall provide a detailed rationale establishing a basis for the contention that use of the strategy is not practical on the site. This rationale shall be submitted in accordance with the Checklist Requirements established by Section II to the Borough of Pitman. A determination by the Borough of Pitman that this rationale is inadequate or without merit shall result in a denial of the application unless one of the following conditions are met:

1. The Land Use Planning and Source Control Plan is amended to include a description of how all nine (9) nonstructural measures will be implemented on the development site, and the amended Plan is approved by the Borough of Pitman;

2. The Land Use Planning and Source Control Plan is amended to provide an alternative nonstructural strategy or measure that is not included in the list of nine (9) nonstructural measures, but still meets the performance standards in Section 26-4, and the amended Plan is approved by the Borough of Pitman; or

3. The Land Use Planning and Source Control Plan is amended to provide an adequate rationale for the contention that use of the particular strategy is not practical on the site, and the amended Plan is approved by the Borough of Pitman.

c. In addition to all other requirements of this section, each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved, protected and maintained according to the minimum standards established by provisions of the Borough of Pitman Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval. Existing trees and vegetation shall be protected during construction activities in accordance with the "Standard for Tree Protection During Construction" provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

d. In addition to all other requirements of this section, each application for major development, and any other application where the Borough of Pitman otherwise requires a landscaping plan, shall contain a landscaping or revegetation plan.

e. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Section 26-4 shall be dedicated to a government entity; shall be subjected to a conservation easement filed with the appropriate County Clerk's office; or shall be subjected to an equivalent form of restriction approved by the Borough of Pitman that ensures that that measure, or equivalent stormwater management measure is maintained in perpetuity, as detailed in Section 26-6.

f. Guidance for nonstructural stormwater management strategies is available in the New Jersey BMP Manual, which may be obtained from the address identified in Section 26-13 or found on the NJDEP's website at www.njstormwater.org.

g. Exception for major development sites creating less than one (1) acre of disturbance. The use of nonstructural strategies to meet the performance standards in Section 26-4 is not required for major development creating less than one (1) acre of disturbance. However, the following requirements shall be met:

1. Each application for major development and any other application where the Borough of Pitman otherwise requires a landscaping plan shall contain a landscaping or revegetation plan;

2. Each applicant shall demonstrate that, at a minimum, existing trees and vegetation on the development site will be preserved and protected according to the minimum standards established by provisions of the Borough of Pitman Land Use Ordinance, Zoning Ordinance or by conditions of zoning or variance approval; and

3. Existing trees and vegetation shall be protected during construction activities in accordance with the "Standard for Tree Protection During Construction" provided in the NJ State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented. (Ord. No. 08-6 § 4A)

26-4.2 Stormwater Runoff Quantity and Rate Standards.

a. The design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Section 26-3, shall either:

1. Demonstrate through hydrologic and hydraulic analysis that the post-developed stormwater runoff hydrographs from the project site for the 2-, 10-, and 100-year storms do not exceed, at any point in time, the site's predeveloped runoff hydrographs for the same storms;

2. Demonstrate through hydrologic and hydraulic analysis that under post-developed site conditions:

(a) There is no increase in pre-developed stormwater runoff rates from the project site for the 2-, 10-, and 100-year storms; and

(b) Any increased stormwater runoff volume or change in stormwater runoff timing for the 2-, 10-, and 100-year storms will not increase flood damage at or downstream of the project site. When performing this analysis for pre-developed site conditions, all off-site development levels shall reflect existing conditions. When performing this analysis for post-developed site conditions, all off-site development levels shall reflect full development in accordance with current zoning and land use ordinances; or

3. Demonstrate that the peak post-developed stormwater runoff rates from the project site for the 2-, 10-, and 100-year storms are 50%, 75% and 80%, respectively, of the

site's peak predeveloped stormwater runoff rates for the same storms. Peak outflow rates from onsite stormwater measures for these storms shall be adjusted where necessary to account for the discharge of increased stormwater runoff rates and/or volumes from project site areas not controlled by the on-site measures. These percentages do not have to be applied to those portions of the project site that are not proposed for development at the time of application, provided that such areas are:

(a) Protected from future development by imposition of a conservation easement, deed restriction, or other acceptable legal measures; or

(b) Would be subject to review under these standards if they are proposed for any degree of development in the future.

4. In tidal flood hazard areas, a stormwater runoff quantity analysis in accordance with paragraphs a.1, a.2, and a.3 above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

5. The standards for stormwater runoff quantity and rate required by this section shall be met using the methods, calculations and assumptions provided in Section 26-3. (Ord. No. 08-6 § 4B)

26-4.3 Groundwater Recharge Standards.

a. For all major developments, with the exception of those described in paragraph d. below, the design engineer, using the assumptions and factors for stormwater runoff and groundwater recharge calculations contained in Section 26-3, shall either:

1. Demonstrate through hydrologic and hydraulic analysis that the post-developed project site maintains one hundred (100%) percent of the site's pre-developed average annual groundwater recharge volume; or

2. Demonstrate through hydrologic and hydraulic analysis that any increase in the project site's stormwater runoff volume for the 2-year, 24-hour storm from predeveloped to post-developed conditions is infiltrated onsite.

b. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all site groundwater recharge measures so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface facilities in the vicinity of the groundwater recharge measure.

c. The standards for groundwater recharge required by this section shall be met using the methods, calculations and assumptions provided in Section 26-3.

d. *Exceptions.*

1. The preceding groundwater recharge standards shall not apply to sites that create less than one (1) acre of disturbance.

2. The preceding groundwater recharge standards shall not apply to projects within the "urban redevelopment are," or to projects subject to paragraph 3. below.

3. The following types of stormwater shall not be recharged:

(a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied; areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and

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

(Ord. No. 08-6 § 4C)

26-4.4 Erosion Control Standards.

The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and its implementing regulations, N.J.A.C. 2:90-1.1 through 1.4. (Ord. No. 08-6 § 4D)

26-4.5 Stormwater Runoff Quality Standards.

a. Stormwater management measures shall be designed to reduce the total suspended solids (TSS) load in the stormwater runoff from the post-developed site by eighty (80%) percent expressed as an annual average.

b. Stormwater management measures shall also be designed to reduce the nutrient load in the stormwater runoff from the post-developed site by the maximum extent practicable. In achieving this reduction, the design of the development site shall include nonstructural and structural stormwater management measures that optimize nutrient removal while still achieving the groundwater recharge, runoff quantity and rate, and TSS removal standards in this section.

c. The standards for stormwater runoff quality required by this section shall be met using the methods, calculations, assumptions and pollutant removal rates provided in Section 26-3.

d. *Exceptions.*

1. The preceding stormwater runoff quality standards shall not apply to the following major development sites:

(a) Major development sites where less than one quarter (0.25) acre of additional impervious surface is proposed; or

(b) Major residential development sites that create less than one (1) acre of disturbance.

2. The TSS reduction requirement in Section 26-4 shall not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the NJPDES rules (N.J.A.C. 7:14A) or in a discharge specifically exempt under a NJPDES permit from this requirement.

3. The stormwater runoff quantity and rate standards in Section 26-4.2 shall still be met for all major development sites.
(Ord. No. 08-6 § 4E)

26-4.6 Threatened and Endangered Species and Associated Habitat Standards.

Stormwater management measures shall avoid adverse impacts of the development on habitat for threatened and endangered species, in accordance with N.J.A.C. 7:8-5.2(c). (Ord. No. 08-6 § 4F)

26-4.7 Exceptions and Mitigation Requirements.

a. Exceptions from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements established by this chapter may be granted, at the discretion of the Borough of Pitman, provided that all of the following conditions are met:

1. The exception is consistent with that allowed by the Borough of Pitman;

2. The Borough of Pitman has an adopted and effective municipal stormwater management plan in accordance with N.J.A.C. 7:8-4.4, which includes a mitigation plan in accordance with N.J.A.C. 7:8-4.2(c)11. The mitigation plan shall identify what measures are necessary to offset the deficit created by granting the exception and the Borough of Pitman shall submit a written report to the county review agency and the NJDEP describing the exception and the required mitigation. Guidance for developing municipal stormwater management plans, including mitigation plans, is available from the NJDEP, Division of Watershed Management and the New Jersey BMP Manual.

3. The applicant demonstrates that mitigation, in addition to the requirements of mitigation plan discussed in paragraph 2 above, will be provided consistent with one of the following options:

(a) Mitigation may be provided off-site, but within the Borough of Pitman and within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standard which is lacking on the development site due to the exception; or

(b) In lieu of the required mitigation, a monetary "in lieu contribution" may be provided by the applicant to the Borough of Pitman in accordance with the following:

(1) The amount of the in lieu contribution shall be determined by the Borough of Pitman, but the maximum in lieu contribution required shall be equivalent to the cost of implementing and maintaining the stormwater management measure(s) for which the exception is granted;

(2) The in lieu contribution shall be used to fund an off-site stormwater control mitigation project(s) located within the Borough of Pitman, within the same drainage area as the development site, and shall meet or exceed the equivalent recharge, quality or quantity performance standards which is lacking on the development site. Such mitigation project shall be identified by the Borough of Pitman in the Borough of Pitman's adopted municipal stormwater management plan. The stormwater control project to which the monetary contribution will be applied shall be identified by the Borough of Pitman at the time the exception is granted. The applicant shall amend the project description and site plan required in subsection 26-2.3c to incorporate a description of both the standards for which an on-site exception is being granted and of the selected off-site mitigation project.

(3) The Borough of Pitman shall expend the in lieu contribution to implement the selected off-site mitigation project within five (5) years from the date that payment is received. Should the Borough of Pitman fail to expend the in lieu contribution within the required time frame, the mitigation option provided in subsection 26-4.7a,3 shall be void and the Borough of Pitman shall be prohibited from collecting in lieu contributions.
(Ord. No. 08-6 § 4G)

26-5 DESIGN, CONSTRUCTION, AND SAFETY STANDARDS FOR STRUCTURAL STORMWATER MANAGEMENT MEASURES.

26-5.1 General Design and Construction Standards.

a. Structural stormwater management measures shall be designed to meet the standards established in this section. These standards have been developed to protect public safety, conserve natural features, create an aesthetically pleasing site and promote proper on-site stormwater management. The Borough of Pitman may require existing basins that pose a public health or safety hazard to be retrofitted to comply with the standards in this subsection.

b. The following structural stormwater management measures may be utilized as part of a stormwater management system at a major land development in the Borough of Pitman, provided that the applicant demonstrates that they are designed, constructed and maintained so as to meet the standards and requirements established by this chapter. If alternative stormwater management measures are proposed, the applicant shall demonstrate that the selected measures will achieve the standards established by this chapter.

1. Bioretention systems;
2. Constructed stormwater wetlands;

3. Extended detention basins;
4. Infiltration basins;
5. Vegetated filter strips;
6. Infiltration basins and trenches;
7. Wet ponds with suitable liners;
8. Pervious paving systems; and

9. Manufactured treatment devices, provided their pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the NJDEP.

c. Structural stormwater management measures shall be designed to take into account the existing site conditions, including environmentally critical areas, wetlands, flood-prone areas, slopes, depth to seasonal high water table, soil type, permeability and texture, and drainage area and drainage patterns.

1. There will be no detention basins in the floodway except for those on-stream.

d. Structural stormwater management measures shall be designed and constructed to be strong, durable, and corrosion resistant (measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.8 shall be deemed to meet this requirement); to minimize and facilitate maintenance and repairs; and to ensure proper functioning.

e. For all stormwater management measures at a development site, each applicant shall submit a detailed Inspection, Maintenance and Repair Plan consistent with the requirements of Section 26-5.

f. To the maximum extent practicable, the design engineer shall design structural stormwater management measures on the development site in a manner that:

1. Limits site disturbance, maximizes stormwater management efficiencies, and maintains or improves aesthetic conditions;

2. Utilizes multiple stormwater management measures, smaller in size and distributed spatially throughout the land development site, instead of a single larger structural stormwater management measure;

3. Incorporates Pretreatment Measures. Pretreatment can extend the functional life and increase the pollutant removal capability of a structural stormwater management measure. Pretreatment measures may be designed in accordance with the New Jersey BMP Manual or other sources approved by the municipal engineer.

g. Stormwater management basins shall be designed in a manner that complements and mimics the existing natural landscape, including but not limited to the following design strategies:

1. Use of natural, non-wetland wooded depressions for stormwater runoff storage; and
 2. Establishment of attractive landscaping in and around the basin that mimics the existing vegetation and incorporates native plants.
- h. Stormwater management basins shall be designed with gently sloping sides. The maximum allowable basin side slope shall be three (3) horizontal to one (1) vertical (3:1).
 - i. Stormwater management facilities shall be designed to function without manual, electric, or mechanical controls.
 - j. Guidance on the design and construction of structural stormwater management measures may be found in the New Jersey BMP Manual. Other guidance sources may also be used upon approval by the municipal engineer.
 - k. After all construction activities and required field testing have been completed on the development site, as-built plans depicting design and as-built elevations of all stormwater management measures shall be prepared by a Licensed Land Surveyor and submitted to the municipal engineer. Based upon the municipal engineer's review of the as-built plans, all corrections or remedial actions deemed by the municipal engineer to be necessary due to the failure to comply with the standards established by this chapter and/or any reasons of public health or safety, shall be completed by the applicant. In lieu of review by the municipal engineer, the Borough of Pitman reserves the right to engage a Professional Engineer to review the as-built plans. The applicant shall pay all costs associated with such review.
(Ord. No. 08-6 § 5A)

26-5.2 Design and Construction Standards for Stormwater Infiltration BMP's.

- a. Stormwater infiltration BMP's, such as bioretention systems with infiltration, dry wells, infiltration basins, pervious paving systems with storage beds, and sand filters with infiltration, shall be designed, constructed and maintained to completely drain the total runoff volume generated by the basin's maximum design storm within seventy-two (72) hours after a storm event. Runoff storage for greater times can render the BMP ineffective and may result in anaerobic conditions; odor and both water quality and mosquito breeding problems.
- b. Stormwater infiltration BMPs shall be designed, constructed and maintained to provide a minimum separation of at least two (2) feet between the elevation of the lowest point of the bottom of the infiltration BMP and the seasonal high water table.
- c. The minimum design permeability rate for the soil within a BMP that relies on infiltration shall be one-half (0.5) inch per hour. A factor of safety of two (2) shall be applied to the soil's field-tested permeability rate to determine the soil's design permeability rate. For example, if the field-tested permeability rate of the soil is four (4) inches per hour, its design permeability rate would be two (2) inches per hour. The minimum design permeability rate for the soil within a stormwater infiltration basin shall also be sufficient to achieve the minimum seventy-two (72) hour drain time described in a. above. The maximum design permeability shall be ten (10) inches per hour.

d. A soil's field tested permeability rate shall be determined in accordance with the following:

1. The predevelopment field test permeability rate shall be determined according to the methodologies provided in Section 26-12;

2. The results of the required field permeability tests shall demonstrate a minimum tested infiltration rate of one (1) inch per hour;

3. After all construction activities have been completed on the site and the finished grade has been established in the infiltration BMP, post-development field permeability tests shall also be conducted according to the methodologies provided in Section 26-12;

4. If the results of the post-development field permeability tests fail to achieve the minimum required design permeability rates in 5 above utilizing a factor of safety of two (2), the stormwater infiltration BMP shall be renovated and re-tested until such minimum required design permeability rates are achieved; and

5. The results of all field permeability tests shall be certified by a Professional Engineer and transmitted to the municipal engineer.

e. To help ensure maintenance of the design permeability rate over time, a six (6) inch layer of K5 soil shall be placed on the bottom of a stormwater infiltration BMP. This soil layer shall meet the textural and permeability specifications of a K5 soil as provided at N.J.A.C. 7:9A, Appendix A, Figure 6, and be certified to meet these specifications by a Professional Engineer licensed in the State of New Jersey. The depth to the seasonal high water table shall be measured from the bottom of the K5 sand layer.

f. The design engineer shall assess the hydraulic impact on the groundwater table and design the project site and all stormwater infiltration basins so as to avoid adverse hydraulic impacts. Adverse hydraulic impacts include, but are not limited to: raising the groundwater table so as to cause surface ponding; flooding of basements and other subsurface structures and areas; preventing a stormwater infiltration basin from completely draining via infiltration within seventy-two (72) hours of a design storm event; and interference with the proper operation of subsurface sewage disposal systems and other surface and subsurface structures in the vicinity of the stormwater infiltration basin.

1. For infiltration basins, a minimum buffer of twenty-five (25) feet shall be maintained between the edge of the basin and the nearest adjacent lot line. In addition, the infiltration basin shall not be located closer than ten (10) feet down-gradient or one hundred (100) feet up-gradient from any foundation.

g. The design engineer shall conduct a mounding analysis, as defined in Section 26-7, of all stormwater infiltration BMPs. The mounding analysis shall be conducted in accordance with the requirements in Section 26-12. Where the mounding analysis identifies adverse impacts, the stormwater infiltration BMP shall be redesigned or relocated, as appropriate.

h. Stormwater infiltration BMPs shall be constructed in accordance with the following:

1. To avoid sedimentation that may result in clogging and reduce the basin's permeability rate, stormwater infiltration basins shall be constructed according to the following:

(a) Unless the conditions in paragraph (b) below are met, a stormwater infiltration BMP shall not be placed into operation until its drainage area is completely stabilized. Instead, upstream runoff shall be diverted around the BMP and into separate, temporary stormwater management facilities and sediment basins. Such temporary facilities and basins shall be installed and utilized for stormwater management and sediment control until stabilization is achieved in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey, which is incorporated herein by reference as amended and supplemented.

(b) If the design engineer determines that, for engineering, environmental or safety reasons, temporary stormwater management facilities and sediment basins cannot be constructed on the site, the stormwater infiltration basin may be placed into operation prior to the complete stabilization of its drainage area provided that the basin's bottom during this period is constructed at a depth at least two (2) feet higher than its final design elevation. All other infiltration BMP construction requirements in this section shall be followed. When the drainage area is completely stabilized, all accumulated sediment shall be removed from the infiltration BMP, which shall then be excavated to its final design elevation in accordance with the construction requirements of this section and the performance standards in Section 26-4.

2. To avoid compaction of subgrade soils of BMP's that rely on infiltration, no heavy equipment such as backhoes, dump trucks or bulldozers shall be permitted to operate within the footprint of the BMP. All excavation required to construct a stormwater infiltration BMP shall be performed by equipment placed outside the BMP. If this is not possible, the soils within the excavated area shall be renovated and tilled after construction is completed to reverse the effects of compaction. In addition, post-development soil permeability testing shall be performed in accordance with paragraph e. above.

3. Earthwork associated with stormwater infiltration BMP construction, including excavation, grading, cutting, or filling, shall not be performed when soil moisture content is above the lower plastic limit.
(Ord. No. 08-6 § 5B)

26-5.3 Safety Standards for Structural Stormwater Management Measures.

a. If a structural stormwater management measure has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide readily accessible means of ingress and egress from the outlet structure.

b. A trash rack is a device intended to intercept runoff-borne trash and debris that might otherwise block the hydraulic openings in an outlet structure of a structural stormwater management measure. Trash racks shall be installed upstream of such outlet structure openings

as necessary to ensure proper functioning of the structural stormwater management measure in accordance with the following:

1. The trash rack should be constructed primarily of bars aligned in the direction of flow with one (1) inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the bars shall be spaced no greater than one-third ($1/3$) the width of the hydraulic opening it is protecting or six (6) inches, whichever is less. Transverse bars aligned perpendicular to flow should be sized and spaced as necessary for rack stability and strength.

2. The trash rack shall not adversely affect the hydraulic performance of either the outlet structure opening it is protecting or the overall outlet structure.

3. The trash rack shall have sufficient net open area under clean conditions to limit the peak design storm velocity through it to a maximum of two and five-tenths (2.5) feet per second.

4. 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 three hundred (300) pounds per square foot.

c. An overflow grate is a device intended to protect the opening in the top of a stormwater management measure outlet structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:

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

2. The overflow grate spacing shall be no more than two (2) inches across the smallest dimension; and

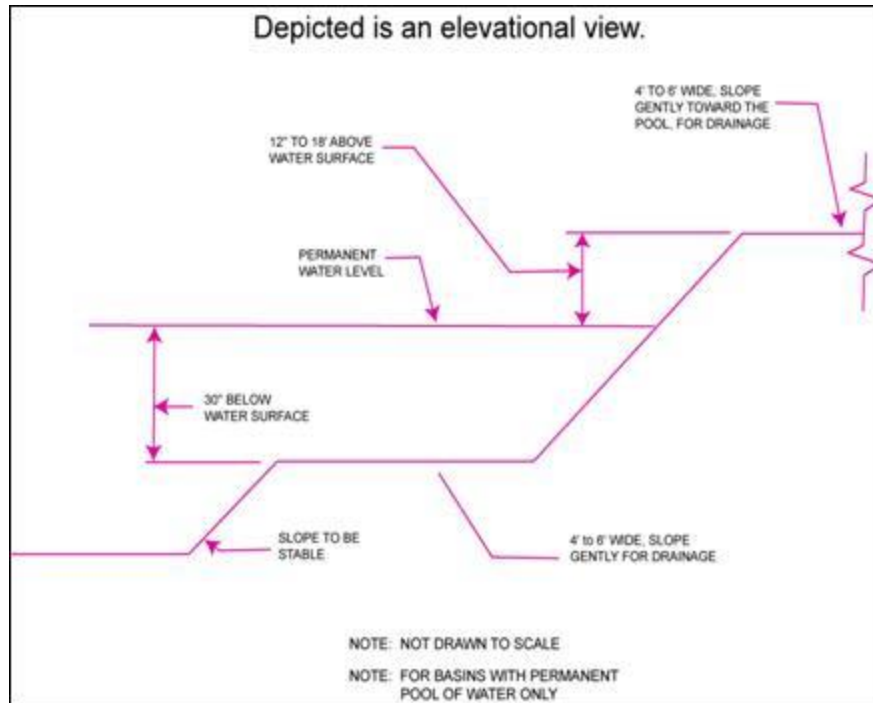
3. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of three hundred (300) pounds per square foot.

d. The maximum side slope for an earthen dam, embankment, or berm shall not be steeper than three (3) horizontal to one (1) vertical (3:1).

e. Safety measures, including but not limited to fencing, warning signs, depth indicator rods, etc., shall be incorporated into the design of all stormwater storage facilities.

f. Safety ledges shall be constructed on the slopes of all new structural stormwater management measures having a permanent pool of water deeper than two and one-half ($2\ 1/2$) feet. Such safety ledges shall be comprised of two (2) steps. Each step shall be four (4) to six (6) feet in width. One step shall be located approximately two and one-half ($2\ 1/2$) feet below the permanent water surface, and the second step shall be located one (1) foot to one and one-half ($1\ 1/2$) feet above the permanent water surface. See 1. below, for an illustration of safety ledges in a stormwater management basin.

1. Illustration of Safety Ledges.



Source: N.J.A.C. 7:8-6 Appendix A.
(Ord. No. 08-6 § 5C)

26-6 INSPECTION, MAINTENANCE AND REPAIR OF STORMWATER MANAGEMENT MEASURES.

26-6.1 Applicability.

Projects subject to review pursuant to subsection 26-1.3 shall comply with the requirements of subsections 26-6.2 and 26-6.3 below. (Ord. No. 08-6 § 6A)

26-6.2 General Inspection, Maintenance and Repair Plan.

a. The design engineer shall prepare an Inspection, Maintenance and Repair Plan for the stormwater management measures, including both structural and nonstructural measures incorporated into the design of a major development. This plan shall be submitted as part of the Checklist Requirements established in subsection 26-2.3. Inspection and maintenance guidelines for stormwater management measures are available in the New Jersey BMP Manual.

b. The Inspection, Maintenance and Repair Plan shall contain the following:

1. Accurate and comprehensive drawings of the site's stormwater management measures;
2. Specific locations of each stormwater management measure identified by means of longitude and latitude as well as block and lot number;

3. Specific preventative and corrective maintenance tasks and schedules for such tasks for each stormwater BMP;
4. Inspection schedules for each facility to be maintained;
5. A list of equipment and skills necessary to perform the required maintenance;
6. Cost estimates, including estimated cost of sediment, debris or trash removal; and
7. The name, address and telephone number of the person or persons responsible for regular inspections and preventative and corrective maintenance (including repair and replacement). If the responsible person or persons is a corporation, company, partnership, firm, association, the Borough of Pitman or political subdivision of this State, the name and telephone number of an appropriate contact person shall also be included.

c. The person responsible for inspection, maintenance and repair identified under paragraph b. above shall maintain a detailed log of all preventative and corrective maintenance performed for the site's stormwater management measures, including a record of all inspections and copies of all maintenance-related work orders in the Inspection, Maintenance and Repair Plan.

d. If the Inspection, Maintenance and Repair Plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for inspection and maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management measure to such person under an applicable ordinance or regulation.

e. If the person responsible for inspection, maintenance and repair identified under paragraph c. above is not a public agency, the maintenance plan and any future revisions based on paragraph f. below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan shall be undertaken.

f. The person responsible for inspection, maintenance and repair identified under paragraph b. above shall evaluate the effectiveness of the Inspection, Maintenance and Repair Plan at least once per year and update the plan and the deed as needed.

g. The person responsible for inspection, maintenance and repair identified under paragraph b. above shall submit the updated Inspection, Maintenance and Repair Plan and the documentation required by paragraph b. and c. above to the Borough of Pitman once per year.

h. The person responsible for inspection, maintenance and repair identified under paragraph b. above shall retain and make available, upon request by any public entity with administrative, health, environmental or safety authority over the site the Inspection, Maintenance and Repair Plan and the documentation required by paragraph b. and c. above.

(Ord. No. 08-6 § 6B)

26-6.3 Transferability.

Responsibility for inspection, repair and 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. (Ord. No. 08-6 § 6C)

26-6.4 Maintenance of Function of Measure.

Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including, but not limited to: repairs or replacement to any associated appurtenance of the measure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; repair or replacement of linings; restoration of infiltration function; mowing and trimming bottoms, side slopes, and embankments. (Ord. No. 08-6 § 6D)

26-6.5 Easements.

Stormwater management measure easements shall be provided by the property owner as necessary for facility inspections and maintenance and preservation of stormwater runoff conveyance, infiltration, and detention areas and facilities. The purpose of the easement shall be specified in the maintenance agreement. (Ord. No. 08-6 § 6E)

26-6.6 Repair of Facility; Repair by Borough.

In the event that the stormwater management measure becomes a public health nuisance or danger to public safety or public health, or if it is in need of maintenance or repair, the Borough of Pitman shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or the Municipal Engineer's designee. The Borough of Pitman, at 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 within the allowable time, the Borough of Pitman may immediately proceed to do so with its own forces and equipment and/or through contractors. The costs and expenses of such maintenance and repair by the Borough of Pitman shall be entered on the tax roll as a special charge against the property and collected with any other taxes levied thereon for the year in which the maintenance and repair was performed. (Ord. No. 08-6 § 6F)

26-6.7 Infiltration BMP Plan.

Requirements for Inspection, Maintenance and Repair of Stormwater BMP's that rely on infiltration. If a stormwater infiltration BMP is incorporated into the design of a major development, the applicant shall include the following requirements in its Inspection, Maintenance and Repair Plan:

- a. Once per month (if needed): Mow side slopes, remove litter and debris, stabilize eroded banks, repair erosion at inflow structure(s);
- b. After every storm exceeding one (1) inch of rainfall: Ensure that infiltration BMPs drain completely within seventy-two (72) hours after the storm event. If stored water fails to infiltrate seventy-two (72) hours after the end of the storm, corrective measures shall be taken.

Raking or tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces;

c. Four (4) times per year (quarterly): Inspect stormwater infiltration BMPs for clogging and excessive debris and sediment accumulation within the BMP, remove sediment (if needed) when completely dry;

d. Two (2) times per year: Inspect for signs of damage to structures, repair eroded areas, check for signs of petroleum contamination and remediate;

e. Once per year: Inspect BMPs for unwanted tree growth and remove if necessary, disc or otherwise aerate bottom of infiltration basin to a minimum depth of six (6) inches; and

f. After every storm exceeding one (1) inch of rainfall, inspect and, if necessary, remove and replace K5 sand layer and accumulated sediment, to restore original infiltration rate.

g. Additional guidance for the inspection, maintenance and repair of stormwater infiltration BMPs can be found in the New Jersey BMP Manual. (Ord. No. 08-6 § 6G)

26-6.8 Maintenance Guarantee.

a. The applicant shall provide a maintenance guarantee in accordance with N.J.S.A. 40:55D-53 to ensure that all stormwater management measures required under the provisions of this chapter will be maintained in accordance with the specifications established herein.

b. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a public agency, the Borough of Pitman shall collect an upfront fee from the applicant in the amount the Borough of Pitman determines is needed to provide long-term inspection, maintenance and repair of all stormwater management measures. This up-front fee shall be placed in a dedicated cash management account and expended by the Borough of Pitman for the sole purpose of conducting inspection, maintenance and repair activities for all stormwater management measures required under the applicant's major development application approval. The calculation of the fee shall be based upon the Inspection, Maintenance and Repair Plan (Plan) required to be prepared by the applicant and approved by the Borough of Pitman. The Plan shall include an estimate of the present value of the cost to inspect, maintain and repair the stormwater management measure(s) in accordance with the Plan for the useful life of those measure(s). The Borough of Pitman shall furnish the applicant their published hourly rates as prescribed by their salary ordinance for public works' and other personnel having responsibilities associated with stormwater management. Added to this fee shall be an amount mutually determined by the Borough of Pitman and the applicant to account for the reconstruction of stormwater management measures that are reasonably anticipated to be subject to long term failure. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed. The amount shall be based on the future value of the measure(s) being reconstructed. Both inflation rates and bank interest rates shall be based on the ten (10) year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an amount. The costs for reconstructing the measure(s) shall be taken from the engineer's probable cost

estimate that is utilized to determine the amount of the required performance guarantee. It is acceptable to attach a percentage of failure to certain line items in the estimate.

c. Additionally, for those stormwater management measures that are to be inspected, maintained and repaired by a homeowners association, condominium association or some other form of non-public ownership, no fee shall be collected by the Borough of Pitman. Instead, the ownership entity shall establish and maintain a fund for the annual inspection and testing program, annual maintenance and repair program and annual contribution to a contingency fund for long-term reconstruction.

The initial costs agreed to for the annual inspection and testing program and annual maintenance and repair program shall be based upon actual itemized proposals offered to the applicant by prospective vendors. The annual cost expended on inspection, testing and maintenance shall be reported to the Borough of Pitman to verify that maintenance is not being deferred and to inform the Borough of Pitman on the magnitude of those services.

The contingency fund shall require sufficient funds to be committed for long-term reconstruction of the stormwater management measure(s). Major reconstruction activities will necessitate proper financial planning. After an agreed number of years, depending on the type of measure(s), the measure(s) will need to be reconstructed. The contingency fund in the financial schedule shall be based on the future value of the measure being reconstructed. Both inflation rates and bank interest rates shall be based on the ten (10) year average published in the Wall Street Journal or other approved publication. Interest accruing in the account must also be accounted for at an agreed upon interest rate, to arrive at an annual contribution amount.

(Ord. No. 08-6 § 6H)

26-7 DEFINITIONS.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter it's most reasonable application. When used in this chapter, the following terms shall have the meanings herein ascribed to them.

The Borough of Pitman shall mean the Planning Board, Zoning Board of Adjustment or other board, agency or official of the Borough of Pitman with authority to approve or disapprove subdivisions, site plans, construction permits, building permits or other applications for development approval. For the purposes of reviewing development applications and ensuring compliance with the requirements of this chapter, the Borough of Pitman may designate the Municipal Engineer or other qualified designee to act on behalf of the Borough of Pitman.

Aquaculture shall mean the propagation, rearing and subsequent harvesting of aquatic organisms in controlled or selected environments, and their subsequent processing, packaging and marketing, including but not limited to, activities to intervene in the rearing process to increase production such as stocking, feeding, transplanting and providing for protection from predators.

Certification shall mean a written statement signed and sealed by a licensed New Jersey Professional Engineer attesting that a BMP design or stormwater management system conforms to or meets a particular set of standards. Depending upon the context in which the term is used, the terms "certify" and "certified" shall be construed accordingly.

Compaction shall mean the increase in soil bulk density caused by subjecting soil to greater-than-normal loading. Compaction can also decrease soil infiltration and permeability rates.

Construction shall mean the construction, erection, reconstruction, alteration, conversion, demolition, removal or equipping of buildings, structures or components of a stormwater management system including but not limited to collection inlets, stormwater piping, swales and all other conveyance systems, and stormwater BMPs.

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

A county planning agency; or

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.

Design engineer shall mean 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.

Design permeability shall mean the tested permeability rate with a factor of safety of two (2) applied to it (e.g., if the tested permeability rate of the soils is four (4) inches per hour, the design rate would be two (2) inches per hour).

Development shall mean the change of or enlargement of any use or disturbance of any land, the performance of any building or mining operation, the division of land into two (2) or more parcels, and the creation or termination of rights of access or riparian rights including, but not limited to:

- a. A change in type of use of a structure or land;
- b. A reconstruction, alteration of the size, or material change in the external appearance of a structure or land;
- c. A material increase in the intensity of use of land, such as an increase in the number of businesses, manufacturing establishments, offices or dwelling units in a structure or on land;
- d. Commencement of resource extraction or drilling or excavation on a parcel of land;
- e. Demolition of a structure or removal of trees;
- f. Commencement of forestry activities;

- g. Deposit of refuse, solid or liquid waste or fill on a parcel of land;
- h. In connection with the use of land, the making of any material change in noise levels, thermal conditions, or emissions of waste material; and
- i. Alteration, either physically or chemically, of a shore, bank, or flood plain, seacoast, river, stream, lake, pond, wetlands or artificial body of water.

In the case of development on agricultural land, i.e. lands used for an agricultural use or purpose as defined at N.J.A.C. 7:50-2.11, development means: any activity that requires a State permit; any activity reviewed by the County Agricultural Boards (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.

Development, major shall mean any "development" that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this chapter is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting or removing of vegetation.

Development, minor shall mean all development other than major development.

Drainage area shall mean a geographic area within which stormwater, sediments, or dissolved materials drain to a BMP, a stormwater management system, a particular receiving waterbody or a particular point along a receiving waterbody.

Environmentally critical area shall mean 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 animal species; threatened or endangered plants of the Pinelands pursuant to N.J.A.C. 7:5C-1.1 et seq.; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. T & E habitat constitutes habitat that is critical for the survival of a local population of threatened and endangered species or habitat that is identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program, whichever is more inclusive.

Exception shall mean the approval by the approving authority of a variance or other material departure from strict compliance with any section, part, phrase or provision of this chapter. An exception may be granted only under certain specific, narrowly-defined conditions described herein.

Extended detention basin shall mean a facility constructed through filling and/or excavation that provides temporary storage of stormwater runoff. It has an outlet structure that detains and attenuates runoff inflows and promotes the settlement of pollutants. An extended detention basin is normally designed as a multi-stage facility that provides runoff storage and attenuation for both stormwater quality and quantity management. The term "stormwater detention basin" shall have the same meaning as "extended detention basin."

Finished grade shall mean the elevation of the surface of the ground after completion of final grading, either via capping, filling or a combination thereof.

Grading shall mean modification of a land slope by cutting and filling with the native soil or re-distribution of the native soil which is present at the site.

Groundwater shall mean water below the land surface in a zone of saturation.

Groundwater mounding analysis shall mean a test performed to demonstrate that the groundwater below a stormwater infiltration basin will not "mound up," encroach on the unsaturated zone, break the surface of the ground at the infiltration area or downslope, and create an overland flow situation.

Heavy equipment shall mean equipment, machinery, or vehicles that exert ground pressure in excess of eight (8) pounds per square inch.

High pollutant loading area shall mean an area in an industrial or commercial development site: where solvents and/or petroleum products are loaded/unloaded, stored, or applied; where pesticides are loaded/unloaded or stored; 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; where recharge would be inconsistent with NJDEP-approved remedial action work plan or landfill closure plan; and/or where a high risk exists for spills of toxic materials, such as gas stations and vehicle maintenance facilities. The term "HPLA" shall have the same meaning as "High Pollutant Loading Area."

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

Infiltration shall mean the process by which precipitation enters the soil through its surface.

In lieu contribution shall mean a monetary fee collected by the Borough of Pitman in lieu of requiring strict on-site compliance with the groundwater recharge, stormwater runoff quantity and/or stormwater runoff quality standards established in this chapter.

Install shall mean to assemble, construct, put in place or connect components of a stormwater management system.

Mitigation shall mean acts necessary to prevent, limit, remedy or compensate for conditions that may result from those cases where an applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in N.J.A.C. 7:8-1.1 et seq., in an adopted regional stormwater management plan, or in a local ordinance which is as protective as N.J.A.C. 7:8-1.1 et seq., and an exception from strict compliance is granted by the Borough of Pitman.

New Jersey Stormwater Best Management Practices Manual shall mean guidance developed by the New Jersey Department of Environmental Protection, in coordination with the New Jersey Department of Agriculture, the New Jersey Department of Community Affairs, the New Jersey Department of Transportation, municipal engineers, county engineers, consulting firms, contractors, and environmental organizations to address the standards in the New Jersey Stormwater Management Rules, N.J.A.C. 7:8-1.1 et seq. The BMP manual provides examples of ways to meet the standards contained in the rule. An applicant may demonstrate that other proposed management practices will also achieve the

standards established in the rules. The manual, and notices regarding future versions of the manual, are available from the Division of Watershed Management, NJDEP, PO Box 418, Trenton, New Jersey 08625; and on the NJDEP's website, www.njstormwater.org. The term "New Jersey BMP Manual" shall have the same meaning as "New Jersey Stormwater Best Management Practices Manual."

NJDEP shall mean the New Jersey Department of Environmental Protection.

NJPDES shall mean the New Jersey Pollutant Discharge Elimination System as set forth in N.J.S.A. 58:10A-1 et seq. and in N.J.A.C. 7:14A-1.1 et seq.

NJPDES permit shall mean a permit issued by the NJDEP pursuant to the authority of the Water Pollution Control Act, N.J.S.A. 58:10A-1 et seq., and N.J.A.C. 7:14A-1.1 et seq. for a discharge of pollutants.

Nonpoint source shall mean:

- a. Any human-made or human-induced activity, factor, or condition, other than a point source, from which pollutants are or may be discharged;
- b. Any human-made or human-induced activity, factor, or condition, other than a point source, that may temporarily or permanently change any chemical, physical, biological, or radiological characteristic of waters of the State from what was or is the natural, pristine condition of such waters, or that may increase the degree of such change; or
- c. Any activity, factor, or condition, other than a point source, that contributes or may contribute to water pollution.

The term "NPS" shall have the same meaning as "nonpoint source."

Nonstructural BMP shall mean a stormwater management measure, strategy or combination of strategies that reduces adverse stormwater runoff impacts through sound site planning and design. Nonstructural BMPs include such practices as minimizing site disturbance, preserving important site features, reducing and disconnecting impervious cover, flattening slopes, utilizing native vegetation, minimizing turf grass lawns, maintaining natural drainage features and characteristics and controlling stormwater runoff and pollutants closer to the source. The term "Low Impact Development technique" shall have the same meaning as "nonstructural BMP."

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

Permeability shall mean the rate at which water moves through a saturated unit area of soil or rock material at hydraulic gradient of one, determined as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), N.J.A.C. 7:9A-6.5 (Pit Bailing Test) or N.J.A.C. 7:9A-6.6 (Piezometer Test). Alternative permeability test procedures may be accepted by the approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical, or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM)

symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this chapter.

Permeable shall mean having a permeability of one (1) inch per hour or faster. The terms "permeable soil," "permeable rock" and "permeable fill" shall be construed accordingly.

Person shall mean any individual, corporation, company, partnership, firm, association, the Borough of Pitman or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.

Pinelands Commission or **Commission** shall mean the Commission created pursuant Section 5 of the Pinelands Protection Act, N.J.S.A. 13:18A-5.

Pinelands CMP shall mean the New Jersey Pinelands Comprehensive Management Plan (N.J.A.C. 7:50 1.1 et seq.).

Point source shall mean any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

Pollutant shall mean any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substances (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, suspended solids, 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.

Professional Engineer shall mean a person licensed to practice Professional Engineering in the State of New Jersey pursuant to N.J.S.A. 48:8-27 et seq.

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

Replicate shall mean one (1) of two (2) or more soil samples or tests taken at the same location (within five (5) feet of each other) and depth, within the same soil horizon or substratum. In the case of fill material, replicate tests are tests performed on sub-samples of the same bulk sample packed to the same bulk density.

Sand shall mean a particle size category consisting of mineral particles which are between 0.05 and 2.0 millimeters in equivalent spherical diameter. Also, a soil textural class having eighty-five (85%) percent or more of sand and a content of silt and clay such that the percentage of silt plus 1.5 times the percentage of clay does not exceed 15, as shown in Section 26-12 (USDA Soil Textural Triangle).

Seasonally high water table shall mean the upper limit of the shallowest zone of saturation which occurs in the soil, identified as prescribed in N.J.A.C. 7:9A-5.8.

Sediment shall mean 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 shall mean the lot or lots upon which a major development is to occur or has occurred.

Soil shall mean all unconsolidated mineral and organic material of any origin which is not a rock substratum, including sediments below the biologically active and/or weathered zones.

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

Stormwater shall mean 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 infiltration BMP shall mean a basin or other facility constructed within permeable soils that provides temporary storage of stormwater runoff. An infiltration BMP does not normally have a structural outlet to discharge runoff from the stormwater quality design storm. Instead, outflow from an infiltration BMP is through the surrounding soil. The terms "infiltration measure" and "infiltration practice" shall have the same meaning as "stormwater infiltration basin."

Stormwater management measure shall mean 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 non-stormwater discharges into stormwater conveyances. This includes, but is not limited to, structural and nonstructural stormwater Best Management Practices described in the New Jersey BMP Manual and designed to meet the standards for stormwater control contained within this chapter. The terms "stormwater Best Management Practice" and "stormwater BMP" shall have the same meaning as "stormwater management measure."

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

Suitable soil shall mean unsaturated soil, above the seasonally high water table, which contains less than fifty (50%) percent by volume of coarse fragments and which has a tested permeability rate of between one (1) and twenty (20) inches per hour.

Surface water shall mean any waters of the State which are not groundwater.

Time of concentration shall mean the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed.

Total Suspended Solids shall mean the insoluble solid matter suspended in water and stormwater that is separable by laboratory filtration in accordance with the procedure contained in the "Standard Methods for the Examination of Water and Wastewater" prepared and published jointly by the American Public Health Association, American Water Works Association and the Water Pollution Control Federation. The term "TSS" shall have the same meaning as "Total Suspended Solids."

Tidal Flood Hazard Area shall mean a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

Urban Redevelopment Area shall mean and is defined as previously developed portions of areas:

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

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

Water table shall mean the upper surface of a zone of saturation.

Well shall mean a bored, drilled or driven shaft, or a dug hole, which extends below the seasonally high water table and which has a depth which is greater than its largest surface dimension.

Wetlands shall mean those lands which are inundated or saturated by water at a magnitude, duration and frequency sufficient to support the growth of hydrophytes. Wetlands include lands with poorly drained or very poorly drained soils as designated by the National Cooperative Soils Survey of the Soil Conservation Service of the United States Department of Agriculture. Wetlands include coastal wetlands and inland wetlands, including submerged lands. The "New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands: A Pinelands Supplement to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands," dated January, 1991, as amended, may be utilized in delineating the extent of wetlands based on the definitions of wetlands and wetlands soils contained in this section, N.J.A.C. 7:50-2.11, 7:50-6.4 and 7:50-6.5. The term "wetland" shall have the same meaning as "wetlands."

Wet pond shall mean a stormwater facility constructed through filling and/or excavation that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows and

promotes the settling of pollutants. A stormwater retention basin can also be designed as a multi-stage facility that also provides extended detention for enhanced stormwater quality design storm treatment and runoff storage and attenuation for stormwater quantity management. The term "stormwater retention basin" shall have the same meaning as "wet pond."

(Ord. No. 08-6 § 7)

26-8 PENALTIES.

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this chapter shall be subject to the following penalties:

a. Any person who engages in unlawful conduct as defined in this chapter shall, upon conviction thereof in a proceeding before a court of competent jurisdiction, be subject to the penalty stated in Chapter I, Section 1-5.

b. Any person who is convicted of violating this chapter within one (1) year of the date of a previous violation of the same chapter and who was fined for the previous violation, shall be sentenced by a court to an additional fine as a repeat offender. The additional fine imposed by the court upon a person for a repeated offense shall not be less than the minimum or exceed the maximum fine fixed for a violation of the chapter, but shall be calculated separately from the fine imposed for the violation of this chapter.

c. The Borough of Pitman may seek injunctive relief in the Superior Court of New Jersey to enforce the terms of this chapter along with any other relief available under the Laws of the State of New Jersey, and nothing herein shall abrogate or limit the Borough's right, ability, and authority to do so.

(Ord. No. 08-6 § 8)

26-9 EFFECTIVE DATE.

This chapter shall take effect immediately upon the following:

a. Approval by the County review agency in accordance with N.J.S.A. 40:55D-97.

b. The New Jersey Stormwater Management Rules at N.J.A.C. 7:8-5.2(a), and subsection 26-4.1, require nonstructural stormwater management strategies to be incorporated into the site design of a major development. A total of nine (9) strategies are to be used to the maximum extent practical to meet the groundwater recharge, stormwater quality and stormwater quantity requirements of the Rules prior to utilizing structural stormwater management measures. The New Jersey Nonstructural Stormwater Management Strategies Point System (NSPS) provides a tool to assist planners, designers and regulators in determining what strategies have been used to the "maximum extent practical" at a major development as required by the Rules. Refer online to <http://www.njstormwater.org> for information on the NSPS.

(Ord. No. 08-6 § 9)

26-10 SEVERABILITY.

If the provisions of any section, subsection, paragraph, subdivision, or clause of this chapter shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision or clause of this chapter. (Ord. No. 08-6 § 10)

26-11 REPEALER.

All prior ordinances or parts of ordinances inconsistent with this chapter be and the same are hereby repealed to the extent of such inconsistencies. (Ord. No. 08-6 § 11)

26-12 APPENDICES.

26-12.1 Methods for Calculating Groundwater Recharge.

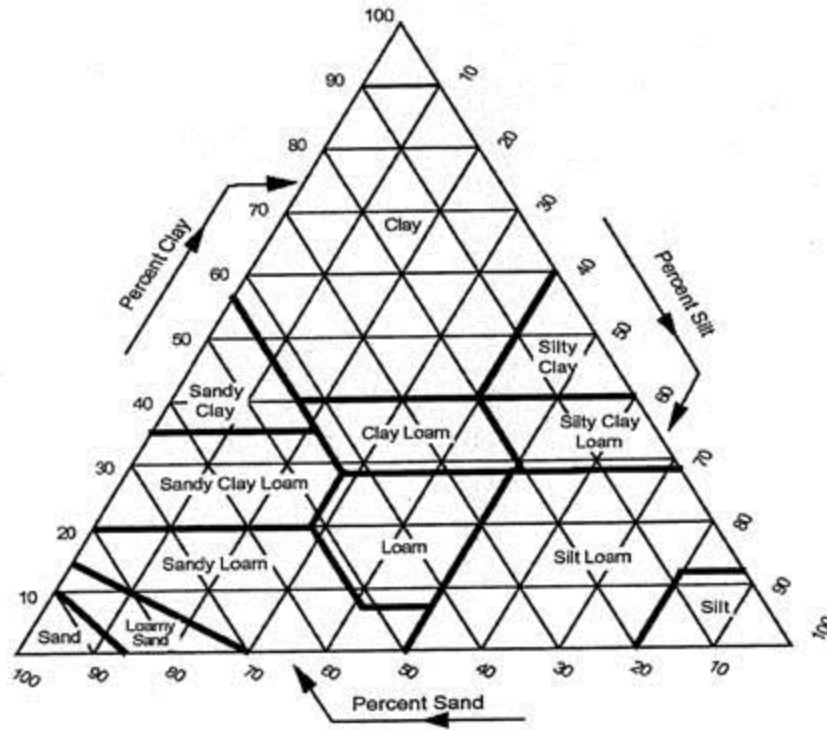
A. The New Jersey Geological Survey Report GSR-32: A Method for Evaluating Groundwater Recharge Areas in New Jersey. Available at <http://www.njgeology.org/geodata/dgs99-2htm>, or its updated equivalent.

B. The New Jersey Groundwater Recharge Spreadsheet (NJGRS). Available in the New Jersey BMP Manual, Chapter 6, at http://www.njstormwater.org/bmp_manual2.htm, or its updated equivalent. (Ord. No. 08-6 § 12A)

26-12.2 NJDEP Nonstructural Strategies Point System.

(Reserved) (Ord. No. 08-6 § 12B)

26-12.3 Soils.



a. *USDA Soil Textural Triangle.*

Source: US Department of Agriculture.

b. *Definitions.* For the purposes of this appendix, the following terms shall have the meanings herein ascribed to them.

A-horizon shall mean the uppermost mineral horizon in a normal soil profile. The upper part of the A-horizon is characterized by maximum accumulation of finely divided, dark colored organic residues, known as humus, which are intimately mixed with the mineral particles of the soil.

Artesian zone of saturation shall mean a zone of saturation which exists immediately below a hydraulically restrictive horizon, and which has an upper surface which is at a pressure greater than atmospheric, either seasonally or throughout the year.

Chroma shall mean the relative purity or strength of a color, a quantity which decreases with increasing grayness. Chroma is one of the three variables of soil color as defined in the Munsell system of classification.

Clay shall mean a particle size category consisting of mineral particles which are smaller than 0.002 millimeters in equivalent spherical diameter. Also, a soil textural class having more than forty (40%) percent clay, less than forty-five (45%) percent sand, and less than forty (40%) percent silt, as shown in paragraph a. above (USDA Soil Textural Triangle).

Clay loam shall mean a soil textural class having twenty-seven (27%) percent to forty (40%) percent clay and twenty (20%) percent to forty-five (45%) percent sand, as shown in paragraph a. above (USDA Soil Textural Triangle).

Coarse fragment shall mean a rock fragment contained within the soil which is greater than two (2) millimeters in equivalent spherical diameter or which is retained on a two (2) millimeter sieve.

County soil survey report shall mean a report prepared by the US Department of Agriculture, Natural Resources Conservation Service which includes maps showing the distribution of soil mapping units throughout a particular county together with narrative descriptions of the soil series shown and other information relating to the uses and properties of the various soil series.

Direct supervision shall mean control over and direction of work carried out by others with full knowledge of and responsibility for such work.

Equivalent spherical diameter of a particle shall mean the diameter of a sphere which has a volume equal to the volume of the particle.

Excessively coarse horizon shall mean a horizon of limited thickness within the soil profile which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

Excessively coarse substratum shall mean a substratum below the soil profile which extends beyond the depth of soil profile pits and borings and which provides inadequate removal of pollutants from stormwater due to a high coarse fragment content, excessively coarse texture and/or excessively rapid permeability.

Extremely firm consistence shall mean a type of soil material whose moist aggregated mass crushes only under very strong pressure; cannot be crushed between the thumb and forefinger and shall be broken apart bit by bit.

Firm consistence shall mean a type of soil material whose moist aggregated mass crushes under moderate pressure between the thumb and forefinger but resistance is distinctly noticeable.

Hard consistence shall mean a type of soil material whose dry aggregated mass is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between the thumb and forefinger.

Hue shall mean the dominant spectral color, one of the three variables of soil color defined within the Munsell system of classification.

Hydraulically restrictive horizon shall mean a horizon within the soil profile which slows or prevents the downward or lateral movement of water and which is underlain by permeable soil horizons or substrata. Any soil horizon which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

Hydraulically restrictive substratum shall mean a substratum below the soil profile which slows or prevents the downward or lateral movement of water and which extends beyond the

depth of profile pits or borings or to a massive substratum. A substratum which has a saturated permeability less than one (1.0) inch per hour is hydraulically restrictive.

Loamy sand shall mean a soil textural class, as shown in paragraph a. above (USDA Soil Textural Triangle), that has a maximum of eighty-five (85%) to ninety (90%) percent sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of fifteen (15); or a minimum of seventy (70%) percent to eighty-five (85%) percent sand with a percentage of silt plus one and a half (1.5) times the percentage of clay not in excess of thirty (30).

Lower plastic limit shall mean the moisture content corresponding to the transition between the plastic and semi-solid states of soil consistency. This corresponds to the lowest soil moisture content at which the soil can be molded in the fingers to form a rod or wire, one-eighth (1/8) inches in thickness, without crumbling.

Mottling shall mean a color pattern observed in soil consisting of blotches or spots of contrasting color. The term "mottle" refers to an individual blotch or spot. The terms "color variegation," "iron depletion" and "iron concentration" are equivalent to the term "mottling." Mottling due to redoximorphic reactions is an indication of seasonal or periodic and recurrent saturation.

Munsell system shall mean a system of classifying soil color consisting of an alpha-numeric designation for hue, value and chroma, such as "7.5 YR 6/2," together with a descriptive color name, such as "strong brown."

O-horizon shall mean a surface horizon, occurring above the A-horizon in some soils, which is composed primarily of undecomposed or partially decomposed plant remains which have not been incorporated into the mineral soil.

Perched zone of saturation shall mean a zone of saturation which occurs immediately above a hydraulically restrictive horizon and which is underlain by permeable horizons or substrata which are not permanently or seasonally saturated.

Piezometer shall mean a device consisting of a length of metal or plastic pipe, open at the bottom or perforated within a specified interval, and used for the determination of depth to water, permeability or hydraulic head within a specific soil horizon or substratum.

Platy structure shall mean and is characterized by a soil aggregate which has one axis distinctly shorter than the other two (2) and is oriented with the short axis vertical.

Regional zone of saturation shall mean a zone of saturation which extends vertically without interruption below the depth of soil borings and profile pits.

Sandy clay shall mean a soil textural class having thirty-five (35%) percent or more of clay and forty-five (45%) percent or more of sand, as shown in paragraph a. above, (USDA Soil Textural Triangle).

Sandy loam shall mean a soil textural class, as shown in paragraph a. above (USDA Soil Textural Triangle), that has a maximum of twenty (20%) percent clay, and the percentage of silt plus twice the percentage of clay exceeds thirty (30), and contains fifty-two (52%)

percent or more sand; or less than seven (7%) percent clay, less than fifty (50%) percent silt, and between forty-three (43%) percent and fifty-two (52%) percent sand.

Silt shall mean a particle size category consisting of mineral particles which are between 0.002 and 0.05 millimeters in equivalent spherical diameter. It also means a soil textural class having eighty (80%) percent or more of silt and twelve (12%) percent or less of clay, as shown in paragraph a. above, (USDA Soil Textural Triangle).

Silt loam shall mean a soil textural class having fifty (50%) percent or more of silt and twelve (12%) percent to twenty-seven (27%) percent of clay; or fifty (50%) percent to eighty (80%) percent of silt and less than twelve (12%) percent of clay, as shown in paragraph a. above, (USDA Soil Textural Triangle).

Silty clay shall mean a soil textural class having forty (40%) percent or more of clay and (40%) percent or more of silt, as shown in paragraph a. above, (USDA Soil Textural Triangle).

Silty clay loam shall mean a soil textural class having twenty-seven (27%) percent to forty (40%) percent of clay and less than twenty (20%) percent of sand, as shown in paragraph a. above, (USDA Soil Textural Triangle).

Soil aggregate shall mean a naturally occurring unit of soil structure consisting of particles of sand, silt, clay, organic matter, and coarse fragments held together by the natural cohesion of the soil.

Soil color shall mean the soil color name and Munsell color designation determined by comparison of the moist soil with color chips contained in a Munsell soil color book.

Soil consistence shall mean the resistance of a soil aggregate or clod to being crushed between the fingers or broken by the hands. Terms for describing soil consistence described are in N.J.A.C. 7:9A-5.3(h).

Soil horizon shall mean a layer within a soil profile differing from layers of soil above and below it in one or more of the soil morphological characteristics including color, texture, coarse fragment content, structure, consistence, and mottling.

Soil log shall mean a description of the soil profile which includes the depth, thickness, color, texture, coarse fragment content, mottling, structure and consistence of each soil horizon or substratum.

Soil mapping unit shall mean an area outlined on a map in a County Soil Survey Report and marked with a letter symbol designating a soil phase, a complex of two (2) or more soil phases, or some other descriptive term where no soil type has been identified.

Soil phase shall mean a specific type of soil which is mapped by the Natural Resources Conservation Service and which belongs to a soil series described within the County Soil Survey Report.

Soil profile shall mean a vertical cross-section of undisturbed soil showing the characteristic horizontal layers or horizons of the soil which have formed as a result of the combined effects of parent material, topography, climate, biological activity and time.

Soil series shall mean a grouping of soil types possessing a specific range of soil profile characteristics which are described within the County Soil Survey Report. Each soil series may consist of several "soil phases" which may differ in slope, texture of the surface horizon or stoniness.

Soil structural class shall mean one of the shape classes of soil structure described in N.J.A.C. 7:9A-5.3(g).

Soil structure shall mean the naturally occurring arrangement, within a soil horizon, of sand, silt and clay particles, coarse fragments and organic matter, which are held together in clusters or aggregates of similar shape and size.

Soil test pit shall mean an excavation made for the purpose of exposing a soil profile which is to be described.

Soil textural class shall mean one of the classes of soil texture defined within the USDA system of classification. (Soil Survey Manual, Agricultural Handbook No. 18, USDA Soil Conservation Service 1962.)

Soil texture shall mean the relative proportions of sand, silt and clay in that portion of the soil which passes through a sieve with two millimeter openings.

Static water level shall mean the depth below the ground surface or the elevation with respect to some reference level, of the water level observed within a soil profile pit or boring, or within a piezometer, after this level has stabilized or become relatively constant with the passage of time.

Substratum shall mean a layer of soil or rock material present below the soil profile and extending beyond the depth of soil borings or profile pits.

Unsuitable soil shall mean all soil other than suitable soil.

USDA system of classification shall mean the system of classifying soil texture used by the United States Department of Agriculture which defines twelve (12) soil textural classes based upon the weight percentages of sand, silt and clay in that portion of the soil which passes through a sieve with two millimeter (2 mm) openings. The soil textural classes are shown graphically on the USDA Soil Textural Triangle, as shown in paragraph a. above.

Value shall mean the relative lightness or intensity of a color, one of the three (3) variables of soil color defined within the Munsell system of classification.

Very firm consistence shall mean and is characterized by a moist soil which crushes under strong pressure; barely crushable between thumb and forefinger.

Very hard consistence shall mean and is characterized by a dry soil which is resistant to pressure, can be broken in the hands only with difficulty; not breakable between the thumb and forefinger.

Zone of saturation shall mean a layer within or below the soil profile which is saturated with ground water either seasonally or throughout the year. This includes both regional and perched zones.

c. *Methods for Assessing Soil Suitability for Infiltration Stormwater Management BMPs.* The results of a subsurface investigation shall serve as the basis for the site selection and design of stormwater infiltration BMPs. The subsurface investigation shall include, but not be limited to, a series of soil test pits and soil permeability tests conducted in accordance with the following:

1. All soil test pits and soil permeability results shall be performed under the direct supervision of a Professional Engineer. All soil logs and permeability test data shall be accompanied by a certification by a Professional Engineer. The results and location (horizontal and vertical) of all soil test pits and soil permeability tests, both passing and failing, shall be reported to the Borough of Pitman.

2. During all subsurface investigations and soil test procedures, adequate safety measures shall be taken to prohibit unauthorized access to the excavations at all times. It is the responsibility of persons performing or witnessing subsurface investigations and soil permeability tests to comply with all applicable Federal, State and local laws and regulations governing occupational safety.

3. A minimum of two (2) soil test pits shall be excavated within the footprint of any proposed infiltration BMP to determine the suitability and distribution of soil types present at the site. Placement of the test pits shall be within twenty (20) feet of the basin perimeter, located along the longest axis bisecting the BMP. For BMPs larger than ten thousand (10,000) square feet in area, a minimum of one (1) additional soil test pit shall be conducted within each additional area of ten thousand (10,000) square feet. The additional test pit(s) shall be placed approximately equidistant to other test pits, so as to provide adequate characterization of the subsurface material. In all cases, where soil and or groundwater properties vary significantly, additional test pits shall be excavated in order to accurately characterize the subsurface conditions below the proposed infiltration BMP. Soil test pits shall extend to a minimum depth of eight (8) feet below the lowest elevation of the basin bottom or to a depth that is at least two (2) times the maximum potential water depth in the proposed infiltration BMP, whichever is greater.

4. A soil test pit log shall be prepared for each soil test pit. The test pit log shall, at a minimum, provide the elevation of the existing ground surface, the depth and thickness (in inches) of each soil horizon or substratum, the dominant matrix or background and mottle colors using the Munsell system of classification for hue, value and chroma, the appropriate textural class as shown on the USDA textural triangle, the volume percentage of coarse fragments (larger than two (2) millimeters in diameter), the abundance, size, and contrast of mottles, the soil structure, soil consistence, and soil moisture condition, using standard USDA classification terminology for each of these soil properties. Soil test pit logs shall identify the presence of any soil horizon, substratum or other feature that exhibits an in-place permeability rate less than one (1) inch per hour.

5. Each soil test pit log shall report the depth to seasonally high water level, either perched or regional, and the static water level based upon the presence of soil mottles or other redoximorphic features, and observed seepage or saturation. Where redoxomorph features including soil mottles resulting from soil saturation are present, they shall be interpreted to represent the depth to the seasonal high water table unless soil saturation or

seepage is observed at a higher level. When the determination of the seasonally high water table shall be made in ground previously disturbed by excavation, direct observation of the static water table during the months of January through April shall be the only method permitted.

6. Any soil horizon or substratum which exists immediately below a perched zone of saturation shall be deemed by rule to exhibit unacceptable permeability (less than one (1) inch per hour). The perched zone of saturation may be observed directly, inferred based upon soil morphology, or confirmed by performance of a hydraulic head test as defined at N.J.A.C. 7:9A-5.9.

7. Stormwater infiltration BMPs shall not be installed in soils that exhibit artesian groundwater conditions. A permeability test shall be conducted in all soils that immediately underlie a perched zone of saturation. Any zone of saturation which is present below a soil horizon which exhibits an in-place permeability of less than two-tenths (0.2) inches per hour shall be considered an artesian zone of saturation unless a minimum one foot thick zone of unsaturated soil, free of mottling or other redoximorphic features and possessing a chroma of four (4) or higher, exists immediately below the unsuitable soil.

8. A minimum of one (1) permeability test shall be performed at each soil test pit location. The soil permeability rate shall be determined using test methodology as prescribed in N.J.A.C. 7:9A-6.2 (Tube Permeameter Test), N.J.A.C. 7:9A-6.5 (Pit Bailing Test) or N.J.A.C. 7:9A-6.6 (Piezometer Test). When the tube permeameter test is used, a minimum of two (2) replicate samples shall be taken and tested. Alternative permeability test procedures may be accepted by the approving authority provided the test procedure attains saturation of surrounding soils, accounts for hydraulic head effects on infiltration rates, provides a permeability rate with units expressed in inches per hour and is accompanied by a published source reference. Examples of suitable sources include hydrogeology, geotechnical or engineering text and design manuals, proceedings of American Society for Testing and Materials (ASTM) symposia, or peer-review journals. Neither a Soil Permeability Class Rating Test, as described in N.J.A.C. 7:9A-6.3, nor a Percolation Test, as described in N.J.A.C. 7:9A-6.4, are acceptable tests for establishing permeability values for the purpose of complying with this chapter.

9. Soil permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum to be left in place below the basin as follows. Where no soil replacement is proposed, the permeability tests shall be conducted on the most hydraulically restrictive horizon or substratum within four (4) feet of the lowest elevation of the basin bottom or to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Where soil replacement is proposed, the permeability tests shall be conducted within the soil immediately below the depth of proposed soil replacement or within the most hydraulically restrictive horizon or substratum to a depth equal to two (2) times the maximum potential water depth within the basin, whichever is greater. Permeability tests may be performed on the most hydraulically restrictive soil horizons or substrata at depths greater than those identified above based upon the discretion of the design or testing engineer. The tested infiltration rate should then be divided by two (2) to establish the soil's design permeability rate. Such division will provide a one hundred (100%) percent safety factor to the tested rate.

10. The minimum acceptable "tested permeability rate" of any soil horizon or substratum shall be one (1) inch per hour. Soil materials that exhibit tested permeability rates slower than one (1) inch per hour shall be considered unsuitable for stormwater infiltration. The maximum reportable "tested permeability rate" of any soil horizon or substratum shall be no greater than twenty (20) inches per hour regardless of the rate attained in the test procedure.

11. After all construction activities have been completed on the development site and the finished grade has been established in the infiltration BMP, a minimum of one permeability test shall be conducted within the most hydraulically restrictive soil horizon or substratum below the as-built BMP to ensure the performance of the infiltration BMP is as designed. Hand tools and manual permeability test procedures shall be used for the purpose of confirming BMP performance. In addition, the infiltration BMP shall be flooded with water sufficient to demonstrate the performance of the BMP. Test results shall be certified to the municipal engineer.

12. A groundwater mounding analysis shall be provided for each stormwater infiltration BMP. The groundwater mounding analysis shall calculate the maximum height of the groundwater mound based upon the volume of the maximum design storm. The Professional Engineer conducting the analysis shall provide the municipal engineer with the methodology and supporting documentation for the mounding analysis used and shall certify to the Borough of Pitman, based upon the analysis, that the groundwater mound will not cause stormwater or groundwater to breakout to the land surface or cause adverse impact to adjacent surface water bodies, wetlands or subsurface structures including but not limited to basements and septic systems. If there is more than one infiltration BMP proposed, the model shall indicate if and how the mounds will interact. The mounding analysis shall be calculated using the most restrictive soil horizon that will remain in place within the explored aquifer thickness unless alternative analyses are authorized by the municipal engineer. The mounding analysis shall be accompanied by a cross section of the infiltration BMP and surrounding topography and the mound analysis shall extend out to the point(s) at which the mound intersects with the preexisting maximum water table elevation.

13. The applicant shall demonstrate that stormwater infiltration BMPs meet the seventy-two (72) hour drain time requirement established in subsection 26-5.2.
(Ord. No. 08-6 § 12C)

26-12.4 Pretreatment Measures for Infiltration BMPs.

By reducing incoming velocities and capturing coarser sediments, pretreatment can extend the functional life and increase the pollutant removal capability of infiltration measures. Therefore, the installation of pretreatment measures is recommended for all development sites. Pretreatment measures may include, but are not limited to, the following:

- a. Vegetative filter strips;
- b. Bioretention systems. Used in conjunction with a bioretention system, the infiltration basin takes the place of the standard underdrain;
- c. Sand filters;

- d. Grassed swales; and
 - e. Detention basins.
- (Ord. No. 08-6 § 12D)

26-12.5 Collection and Conveyance.

a. *Bicycle-Safe Inlet Grates.* Site development plans that incorporate site design features that help to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids.

1. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:

(a) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or

(b) A different grate, if each individual clear space in that grate has an area of no more than seven (7) square inches, or is no greater than one half (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 basin floors.

2. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two (2) or more clear spaces) shall have an area of no more than seven (7) square inches, or be no greater than two (2) inches across the smallest dimension.

3. This standard does not apply:

(a) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;

(b) Where flows from the water quality design storm as specified in Section 26-3 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 four and five-eighths (4 and 5/8) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or

(2) A bar screen having a bar spacing of one-half (0.5) inch.

(c) Where flows are conveyed through a trash rack that has parallel bars with one (1) inch spacing between the bars, to the elevation of the water quality design storm as specified in Section 26-3; or

(d) Where the NJDEP 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.

b. *Catch Basins.* Catch basins are storm drain inlets with or without sumps. Catch basins may provide pretreatment for other stormwater BMPs by capturing large sediments. The sediment and pollutant removal efficiency of catch basins depends on the size of the sump and the performance of routine maintenance to retain the available sediment storage space in the sump. Where catch basins with sumps are proposed, the minimum two (2) feet separation between the bottom of the sump and seasonally high water table shall be provided.

c. *Open or Perforated Conveyance Piping.* Where adequate separation to the seasonal high water table exists, stormwater from the development site may be conveyed to a stormwater basin via a system of perforated pipes. These pipes may be made of PVC or corrugated metal and are available with perforations of varying size and spacing. Perforated pipe specifications shall be certified by a Professional Engineer. A Professional Engineer shall certify that perforated conveyance piping will not act to intercept the seasonal high water table and convey groundwater to the stormwater basin. All open or perforated stormwater conveyance systems shall be installed with a minimum separation of two (2) feet from the seasonal high water table.
(Ord. No. 08-6 § 12E)

26-13 ADDITIONAL SOURCES FOR TECHNICAL GUIDANCE.

26-13.1 NJDEP Technical Guidance Sources.

a. *New Jersey BMP Manual.* Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at <http://www.njstormwater.org>, or its updated equivalent.

b. *NJDEP Stormwater Management Facilities Maintenance Manual.* Available from the Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey 08625; or online at <http://njedl.rutgers.edu/ftp/PDFs/1188.pdf>, or its updated equivalent.
(Ord. No. 08-6 § 13A)

26-13.2 Additional Guidance Sources.

a. New Jersey Pinelands Commission, PO Box 7, 15 Springfield Road, New Lisbon, New Jersey 08064; Phone: 609-894-7300; Website: <http://www.state.nj.us/pinelands>, or its updated equivalent.

b. State Soil Conservation Committee Standards for Soil Erosion and Sediment Control in New Jersey. Available from all State Soil Conservation Districts.

c. *State Soil Conservation Districts*. See Gloucester County Soil Conservation District, 4 Parke Place Blvd., Suite-C, Sewell, NJ 08080.

d. New Jersey Department of Transportation, PO Box 600, Trenton, NJ 08625-0600; Phone: 609-530-3536; Website: <http://www.state.nj.us/transportation>, or its updated equivalent. (Ord. No. 08-6 § 13B)

CHAPTER XXVI STORMWATER MANAGEMENT

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