Municipal Stormwater Management Plan

for the

Borough of Fort Lee
Bergen County, New Jersey

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I. INTRODUCTION

This Municipal Stormwater Management Plan (hereinafter the MSWMP or the Plan) documents the strategy for the Borough of Fort Lee (the Borough) to address stormwater-related impacts. The creation of this Plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations.

This Plan contains the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The Plan addresses groundwater recharge, stormwater quantity and stormwater quality impacts by incorporating stormwater design and performance standards for new major developments, defined as projects that disturb one or more acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality, water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies.

A build-out analysis is not required in this Plan based upon existing zoning and land available for development. The Plan also addresses the review and update of existing ordinances, the Borough Master Plan and other planning documents to allow for project designs that include low-impact development techniques. The Borough Master Plan was last reviewed in April 2001. The final component of this Plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the Plan, specific stormwater management measures are identified to lessen the impact of existing development.
II. GOALS

The goals of this MSWMP as well as a brief description of the Borough’s strategies to implement the goals are as follows:

- **Reduce flood damage, including damage to life and property.**
  The Borough is currently incorporating several non-structural stormwater strategies into their Zoning and Site Plan ordinances. The purpose of some of these non-structural strategies is to reduce flooding and therefore reduce damage to life and property.

- **Minimize, to the extent practical, any increase in stormwater runoff from any new development.**
  Current Residential Site Improvement Standards (RSIS) require a reduction in runoff during all rain events for residential developments. Commercial developments will be required to follow all regulations in N.J.A.C. 7:8 and 7:15 to minimize any increase in stormwater runoff.

- **Reduce soil erosion from any development or construction project.**
  Currently, all development projects are required to obtain approval from the Bergen County Soil Conservation District if their area of disturbance is above 5,000 square feet. The BCSCD will only approve the application if the proper soil erosion measures have been proposed.

- **Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures.**
  The Borough is working to eliminate pollution and minimize soil erosion by adopting various ordinances. Also, as part of their Stormwater Pollution Prevention Plan (SP3), the Borough
is required to retro-fit all existing inlets with new NJDEP approved curb pieces. This will also help limit litter in the Borough’s stormwater systems and prevent any blockages.

- **Maintain groundwater recharge.**
  The Borough currently enforces existing ordinances limiting the amount of development that can occur on any particular site. This can maintain or increase the groundwater recharge by simply limiting the amount of maximum impervious coverage allowed. The Borough is also working to reinforce its current ordinance with new non-structural stormwater strategies such as driveway swales or porous pavement which will allow for increased groundwater recharge.

- **Prevent, to the greatest extent feasible, an increase in non-point pollution.**
  The Borough has recently adopted several ordinances with applicable fines to help prevent non-point source pollution. These ordinances include litter, wildlife feeding, pet waste, and yard waste management.

- **Maintain the integrity of stream channels for their biological functions, as well as for drainage.**
  As stated above, the Borough has adopted wildlife feeding and pet waste ordinances. These ordinances will decrease the amount of biological pollutants allowed to reach the Borough’s waterways and assist in reducing or preventing TMDL’s.

- **Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological...**
III. STORMWATER DISCUSSION

Land development can dramatically alter the hydrologic cycle (Image 1) of a site and ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration.

Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site’s evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site.

Impervious areas that are connected to each other through gutters, channels and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel.

Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also
negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.
In addition to increases in runoff peaks, volumes and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients. In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.
IV. BACKGROUND

Fort Lee encompasses 2.53-square miles in eastern Bergen County, New Jersey. The Borough is primarily built-out with 239-acres of remaining developable open space equating to approximately 14.7% of the Borough’s total area. The Borough depends entirely on sanitary sewers, however about 75% of the sewers are a combined system. The combined sewer overflow (CSO) conveys both storm drainage and sanitary sewerage to the Bergen County Utilities Authority (BCUA) in Little Ferry, New Jersey. During heavy rainfalls when the combined flow reaches a certain flow rate, some of the flow is diverted to an outfall at a nearby waterway. The Borough’s CSO system includes three (3) pump stations and two (2) outfalls located along the Hudson River. Figure 3 illustrates the areas that are serviced by the combined sewer systems. Additionally United Water supplies almost 100% of the Borough’s potable water. Figure 1 illustrates Fort Lee’s waterways while Figure 2 depicts the Borough boundary on the United States Geological Survey (USGS) Quadrangle Maps. Additionally, there are no potable supply wells in the Borough so a wellhead protection map is not provided.

The Borough’s population decreased from 32,449 in 1980 to 31,997 in 1990. The population then increased to 35,461 in 2000. This recent population increase has likely resulted in demand for new development. In addition to the Borough’s population, the number of dwelling units has also increased. In 1980, there were 15,486 dwelling units in the Borough. The number of dwelling units increased to 16,847 in 1990 and to 17,446 in 2000. There are also several new developments in neighboring municipalities. Palisades Park expects construction to begin on a new apartment building near the border between Palisades Park and Fort Lee. This new development may add some impervious coverage and increase runoff to the Borough of Fort Lee.
Since Fort Lee is an older primarily developed community, increased stormwater runoff volumes and pollutant loadings have likely impacted the Borough’s waterway. Dwelling units constructed since the 1980s implement some of the new performance standards and best management practices (BMP) to alleviate increased stormwater runoff and pollutant loadings.

The majority of the Borough lies within the Metropolitan Planning Area (PA-1). This planning area designated to areas that are considered Urban Redevelopment Area and are not subject to groundwater recharge requirements. Additionally, the northeast portion of the Borough contains part of the Palisades State Park. This park is located along the Hudson River and is considered PA-7 (Federal Park).

The New Jersey Department of Environmental Protection (NJDEP) is designating an increasing number of streams in the State as Category-1 (C1) waterways, especially those that provide drinking water and important habitat for threatened and endangered species as well as popular recreation fish such as trout. Streams can be designated as C1 based on their ecological significance, recreational or aesthetic significance, water supply significance, fisheries resources, shellfisheries or their location within publicly preserved open space. The C1 designation prevents further degradation in existing water quality. Moreover a 300’ buffer is established around the C1 waterways and is referred to as a Special Water Resource Protection Area (SWRPA). The Borough of Fort Lee contains no C1 designated waterways.
The Hudson River is the only major water body located in the Borough and flows north to south along the Fort Lee’s eastern border. The Hudson River has a SE2 Surface Water Quality Standard (SWQS) classifying the river as a saline estuary (SE2). All former waterways within the Borough have since been piped, most likely to allow for further development.

A Map depicting the Borough’s major waterways is included as Figure 1.

Fort Lee is located in Watershed Management Area 5 (WMA-5), Hackensack, Pascack. The WMA-5 is divided into smaller sub-watersheds assigned a 14 digit Hydrologic Unit Code (HUC-14). The three (3) different HUC-14s are shown in Figure 4.

The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state’s waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a 5-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics.

The NJDEP, U.S. Environmental Protection Agency, and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the instream mercury concentrations of the Hudson River exceed the State’s criteria. This means that the river is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants of each waterway. A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or intercfering...
with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs. The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed. The Integrated List does not indicate if the mercury TMDL for the Hudson River applies specifically to the Borough. Rather, the TMDL reflects this large waterway’s health throughout the northeast region of the State.

The Borough has exhibited water quantity problems including flooding and stream bank erosion. Areas in the southwest portion of the Borough around 11th Street, near the Long Swamp and the Palisades Park border, flood during heavy storm events. Most of the runoff from the surrounding area drains to the Long Swamp. The Borough of Fort Lee is evaluating long-term mitigation options that may include dredging the Long Swamp to alleviate some of the flooding problems.
V. DESIGN AND PERFORMANCE STANDARDS

The Borough has reviewed its existing ordinances and adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include language for maintenance of stormwater management measures consistent with the Stormwater Management Rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and the safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances have been submitted to Bergen County for review and approval.

In addition to the adoption of the above performance standards during construction projects, Borough inspectors will observe projects to ensure that the stormwater management measures are constructed and function as designed. The Borough will also assume responsibility for the operation and maintenance of the stormwater management facilities.
VI. PLAN CONSISTENCY

The Borough is not within a Regional Stormwater Management Planning Area, therefore, this Plan does not need to be consistent with any regional stormwater management plans (RSWMP).

If a RSWMP is developed in the future, this MSWMP will be updated as necessary to be consistent. Bergen County is currently creating a County Stormwater Management Plan that should be complete in 2005. This MSWMP will be updated as necessary to be consistent with the County Stormwater Management Plan.

The MSWMP is consistent with the Residential Site Improvement Standards (RSIS) detailed in N.J.A.C. 5:21. The Borough will utilize the most current RSIS during the stormwater management review of residential development. This MSWMP will be updated to be consistent with any future changes to the RSIS.

The Borough’s existing ordinances also require new development and redevelopment plans to comply with New Jersey’s Soil Erosion and Sediment Control Standards. Any project with over 5,000 square feet of disturbance will require approval from Bergen County Soil Conservation District. Additionally, if a project disturbs over 1-acre, a Request for Authorization (RFA) must be submitted to the NJDEP Bureau of Non-Point Pollution Control. Construction shall not begin until all required approvals are received. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.
VII. NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The Borough has adopted its Stormwater Control Ordinance. This ordinance was submitted to the County but received a disapproval. The Borough will revise their ordinance to include non-structural management strategies in accordance with the County's requirements. Once the ordinance texts are complete, they will be re-submitted to the County review agency for review and approval. A copy will also be sent to the NJDEP at the time of submission.
As previously mentioned, a detailed land use analysis is not required since Fort Lee contains only 239-acres of vacant developable land, less than the State’s 640-acre threshold. In support of the aforementioned we have included Figure 6 illustrating the existing land use in the Borough based on NJDEP’s 1995/97 GIS information. Moreover Figure 4 illustrates the HUC14s within the Borough; Figure 5 presents Fort Lee’s groundwater recharge areas; Figure 7 presents the Borough’s zoning; Figure 8 illustrates the Borough’s constrained lands; and Figure 9 depicts floodplains located within the Borough.
1. **Water Quality**
   a) Retrofit an existing stormwater management facility on a Borough-owned property to provide the removal of 80 percent of total suspended solids (TSS) from the parking lot runoff.
   b) Retrofit the existing parking area on a Borough-owned property to provide the removal of 80 percent of TSS.

2. **Water Quantity**
   a) Install stormwater management measures in an open space to reduce the peak flow from an upstream development on the receiving stream by 20 cubic feet per second (cfs), 35 cfs, and 100 cfs for the 2, 10, and 100-year storms respectively.

3. **Groundwater Recharge**
   a) Retrofit an existing Borough-owned property to provide an additional 300,000 cubic feet of average annual groundwater recharge.
   b) Replace an existing deteriorated impervious parking lot on a Borough-owned property.

B. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option A, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.
1. Water Quality

a) Re-establish a vegetative buffer (minimum 50 foot wide) along 1,500 linear feet of the shoreline at one of the Borough’s lakes or ponds as a goose control measure and to filter stormwater runoff from the high goose traffic areas.

b) Provide goose management measures, including public education at the Borough’s parks.

The municipality may allow a developer to provide funding or partial funding to the municipality for a project that has been identified by the Borough Engineer or towards the development of a RSMP. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.
Figure 3: Borough of Fort Lee Sewage Facilities

Legend

- **Combined Sewers**
- **Serviced by separate sanitary and drainage systems**

Source: Borough of Fort Lee boundary taken from the New Jersey Department of Environmental Protection, Bergen County Municipalities shapefile (2003)
Figure 4: Hydrologic Units (HUC-14) in the Borough of Fort Lee

Legend

HUC14 - Sub-Watershed Name
- Hudson River
- Overpeck Creek
- Hackensack R (Bellmans Ck to Ft Lee Rd)

Figure 5: Groundwater Recharge Areas in the Borough of Fort Lee

Source: Taken from the New Jersey Geological Survey, shapefile DGSO2-3 (Publication Date Not Available).
Figure 6: Existing Land Use in the Borough of Fort Lee

Source: Land Use information taken from the New Jersey Department of Environmental Protection, 1995/97 Land Use/Land Cover shapefile (December 2000).
Figure 7: Zoning Districts in the Borough of Fort Lee

Legend

ZONE
- Age Restricted Apartment Residential
- Central Business District
- Eight-Story Apartment
- Garden Apartment
- High Rise Apartment
- Highway Development
- Light Industrial & Office
- Limited Business
- Limited Business/Redevelopment Overlay District
- Low Rise Residential Zone
- Mid-Rise Residential Zone
- Mixed Use Zone
- Moderate Density Apartment
- Neighborhood Business
- One & Two Family Residential
- One Family Residential
- PARK
- Planned Business District
- Planned Commercial/Residential
- Redevelopment District
- Routes 4 & 80
- Six-Story Apartment
- Six-Story Apartment
- Special Business

Source: Borough of Fort Lee Zoning Map, Boswell Engineering, Revised through April 8, 2004.
Figure 8: Freshwater Wetlands and Water Land Uses within the Borough of Fort Lee (Constrained Land)

Legend
- Green: Freshwater Wetlands
- Blue: Waterways

Figure 9: Borough of Fort Lee Floodplain Map

Legend

- **Roads**
- **FEMA Flood**

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<td>500-year discharge contained in channel/culvert</td>
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<tr>
<td>A</td>
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<tr>
<td>AE</td>
<td>100-year flood; base flood elevations determined</td>
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<tr>
<td>AH</td>
<td>Flood depth of 1-3 feet (usually areas of ponding); average depth determined</td>
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<tr>
<td>AO</td>
<td>Flood depth of 1-3 feet (usually sheet flow on sloping terrain); average depth determined</td>
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<td>Areas outside 500-year floodplain</td>
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Chapter 358

STORMWATER MANAGEMENT

§ 358-1. Scope and purpose.

§ 358-2. Definitions.


§ 358-4. Stormwater management requirements for major development.

§ 358-5. Calculation of stormwater runoff and groundwater recharge.


§ 358-7. Sources for technical guidance.


§ 358-9. Requirements for a site development stormwater plan.

§ 358-10. Maintenance and repair.

§ 358-11. Violations and penalties.

§ 358-12. Effective date.

[HISTORY: Adopted by the Mayor and Council of the Borough of Fort Lee 3-23-2006 by Ord. No. 2006-20. Amendments noted where applicable.]

GENERAL REFERENCES

Land use procedures — See Ch. 261.
Sewers — See Ch. 336.
Site plan review — See Ch. 345.

Improper disposal of waste to storm sewer — See Ch. 366, Art. IX.
Subdivision of land — See Ch. 365.
Zoning — See Ch. 410.

§ 358-1. Scope and purpose.

A. Policy statement. Flood control, groundwater recharge, and pollutant reduction through nonstructural or low-impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose. It is the purpose of this chapter to establish minimum stormwater management requirements and controls for "major development," as defined in § 258-2.

C. Applicability.
§ 358-1

This chapter shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:

(a) Nonresidential major developments; and

(b) Aspects of residential major developments that are not preempted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

(2) This chapter shall not be applicable to all major developments undertaken by Borough of Fort Lee.

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

§ 358-2. Definitions.

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

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

CAFRA CENTERS, CORES OR NODES — Those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

COMPACTION — The increase in soil bulk density.

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

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

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

DEPARTMENT — The New Jersey Department of Environmental Protection.

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

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

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

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

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

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

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

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

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

MAJOR DEVELOPMENT — Any development that provides for ultimately disturbing one or more acres of land. Disturbance for the purpose of this rule is the placement of impervious
surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

MUNICIPALITY — Any city, borough, town, Township, or village.

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

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

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

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

RECHARGE — The amount of water from precipitation that infiltrates into the ground and is not evaporated.

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

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

SOIL — All unconsolidated mineral and organic material of any origin.

STATE DEVELOPMENT AND REDEVELOPMENT PLAN METROPOLITAN PLANNING AREA (PA1) — An area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state's future redevelopment and revitalization efforts.

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

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

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

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

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

TIDAL FLOOD HAZARD AREA — A flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

URBAN COORDINATING COUNCIL EMPowerMENT NEIGHBORHOOD — A neighborhood given priority access to state resources through the New Jersey Redevelopment Authority.

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

URBAN REDEVELOPMENT AREA — Previously developed portions of areas:

A. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;

B. Designated as CAFRA Centers, Cores or Nodes;

C. Designated as Urban Enterprise Zones; and

D. Designated as Urban Coordinating Council Empowerment Neighborhoods.

WATERS OF THE STATE — The ocean and its estuaries, all springs, streams, wetlands, and bodies of surface or groundwater, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

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


A. Design and performance standards for stormwater management measures.

(1) Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in § 358-4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.
§ 358-3

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

Note: Alternative standards shall provide at least as much protection from stormwater-related loss of groundwater recharge, stormwater quantity and water quality impacts of major development projects as would be provided under the standards in N.J.A.C. 7:8-5.

§ 358-4. Stormwater management requirements for major development.

A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with § 358-10.

B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly Helonias bullata (swamp pink) and/or Clemmys muhinebergi (bog turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § 358-4F and G:

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

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

   (3) The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.

D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of § 358-4F and G may be obtained for the enlargement of an existing public roadway or railroad or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:

   (1) The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
The applicant demonstrates through an alternatives analysis that, through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of § 358-4F and G to the maximum extent practicable;

The applicant demonstrates that, in order to meet the requirements of § 358-4F and G, existing structures currently in use, such as homes and buildings, would need to be condemned; and

The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under Subsection D(3) above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of § 358-4F and G that were not achievable on site.

E. Nonstructural stormwater management strategies.

(1) To the maximum extent practicable, the standards in § 358-4F and G shall be met by incorporating nonstructural stormwater management strategies set forth at § 358-4E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

(2) Nonstructural stormwater management strategies incorporated into site design shall:

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

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

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

(d) Minimize the decrease in the time of concentration from preconstruction to postconstruction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;

(e) Minimize land disturbance including clearing and grading;

(f) Minimize soil compaction;

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

(h) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;
(i) Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

[1] Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy § 358-4E(3) below;

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

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


(3) Site design features identified under § 358-4E(2)(i)(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see § 358-4E(3)(c) below.

(a) 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:

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

[2] A different grate, if each individual clear space in that grate has an area of no more than 7.0 square inches, or is no greater than 0.5 inches across the smallest dimension.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
§ 358-4 STORMWATER MANAGEMENT

(b) Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than 7.0 square inches, or be no greater than 2.0 inches across the smallest dimension.

(c) This standard does not apply:

[1] Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practically be overcome by using additional or larger storm drain inlets that meet these standards;

[2] Where flows from the water quality design storm as specified in § 358-4G(1) are conveyed through any device (e.g., end-of-pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:

[a] A rectangular space 4 5/8 inches long and 1 1/2 inches wide (this option does not apply for outfall netting facilities); or

[b] A bar screen having a bar spacing of 0.5 inches.

[3] Where flows are conveyed through a trash rack that has parallel bars with one-inch spacing between the bars, to the elevation of the water quality design storm as specified in § 358-4G(1); or

[4] Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

(4) Any land area used as a nonstructural stormwater management measure to meet the performance standards in § 358-4F and G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.


F. Erosion control, groundwater recharge and runoff quantity standards.

(1) This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.
(a) The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

(b) The minimum design and performance standards for groundwater recharge are as follows:

[1] The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at § 358-5, either:

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

[b] Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from preconstruction to postconstruction for the two-year storm is infiltrated.

[2] This groundwater recharge requirement does not apply to projects within the urban redevelopment area, or to projects subject to Subsection F(1)(b)[3] below.

[3] The following types of stormwater shall not be recharged:

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

[b] Industrial stormwater exposed to source material. "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels; and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
[4] The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.

(c) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at § 358-5, complete one of the following:

[1] Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, postconstruction runoff hydrographs for the two-, ten- and one-hundred-year storm events do not exceed, at any point-in-time, the preconstruction runoff hydrographs for the same storm events;

[2] Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the preconstruction condition, in the peak runoff rates of stormwater leaving the site for the two-, ten- and one-hundred-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

[3] Design stormwater management measures so that the postconstruction peak runoff rates for the two-, ten- and one-hundred-year storm events are 50%, 75% and 80%, respectively, of the preconstruction peak runoff rates. The percentages apply only to the postconstruction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to postconstruction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or

[4] In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsection F(1)(c)[1], [2] and [3] above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

(2) Any application for a new agricultural development that meets the definition of major development at § 358-2 shall be submitted to the appropriate soil conservation district for review and approval in accordance with the requirements of this section and any applicable soil conservation district guidelines for stormwater runoff quantity and erosion control. For the purposes of this section,
"agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater runoff quality standards.

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

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Cumulative Rainfall (inches)</th>
<th>Time (minutes)</th>
<th>Cumulative Rainfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.0000</td>
<td>65</td>
<td>0.8917</td>
</tr>
<tr>
<td>5</td>
<td>0.0083</td>
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<td>0.0250</td>
<td>80</td>
<td>1.0840</td>
</tr>
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<td>0.0500</td>
<td>85</td>
<td>1.1170</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

(2) For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in § 358-7, or found on the Department's Web
site at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in § 358-7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418, Trenton, New Jersey, 08625-0418.

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

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

Where:
- \( R \) = total TSS percent load removal from application of both BMPs
- \( A \) = the TSS percent removal rate applicable to the first BMP
- \( B \) = the TSS percent removal rate applicable to the second BMP

Table 2: TSS Removal Rates for BMPs

<table>
<thead>
<tr>
<th>Best Management Practice</th>
<th>TSS Percent Removal Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioretention systems</td>
<td>90</td>
</tr>
<tr>
<td>Constructed stormwater wetland</td>
<td>90</td>
</tr>
<tr>
<td>Extended detention basin</td>
<td>40-60</td>
</tr>
<tr>
<td>Infiltration structure</td>
<td>80</td>
</tr>
<tr>
<td>Manufactured treatment device</td>
<td>See § 358-6C</td>
</tr>
<tr>
<td>Sand filter</td>
<td>80</td>
</tr>
<tr>
<td>Vegetative filter strip</td>
<td>60-80</td>
</tr>
<tr>
<td>Wet pond</td>
<td>50-90</td>
</tr>
</tbody>
</table>

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

(5) Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the postconstruction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in § 358-4F and G.
Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in § 358-7.

In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

(a) The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

[1] A three-hundred-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the center line of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided.

[2] Encroachment within the designated special water resource protection area under Subsection G(8)(a)[1] above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top-of-bank of the waterway or center line of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.

(b) All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the standard for off-site stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq.

(c) If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the standard for off-site stability in the "Standards for Soil Erosion and Sediment Control in New Jersey,"
established under the Soil Erosion and Sediment Control Act, N.J.S.A.
4:24-39 et seq., then the stabilization measures in accordance with the
requirements of the above standards may be placed within the special water
resource protection area, provided that:

[1] Stabilization measures shall not be placed within 150 feet of the
Category One waterway;

[2] Stormwater associated with discharges allowed by this section shall
achieve a ninety-five-percent TSS postconstruction removal rate;

[3] Temperature shall be addressed to ensure no impact on the receiving
waterway;

[4] The encroachment shall only be allowed where the applicant
demonstrates that the functional value and overall condition of the
special water resource protection area will be maintained to the
maximum extent practicable;

[5] A conceptual project design meeting shall be held with the appropriate
Department staff and soil conservation district staff to identify necessary
stabilization measures; and

[6] All encroachments proposed under this section shall be subject to
review and approval by the Department.

(d) A stream corridor protection plan may be developed by a regional stormwater
management planning committee as an element of a regional stormwater
management plan, or by a municipality through an adopted municipal
stormwater management plan. If a stream corridor protection plan for a
waterway subject to § 358-4G(8) has been approved by the Department of
Environmental Protection, then the provisions of the plan shall be the
applicable special water resource protection area requirements for that
waterway. A stream corridor protection plan for a waterway subject to
Subsection G(8) shall maintain or enhance the current functional value and
overall condition of the special water resource protection area as defined in
Subsection G(8)(a)[1] above. In no case shall a stream corridor protection
plan allow the reduction of the special water resource protection area to less
than 150 feet as measured perpendicular to the waterway subject to this
subsection.

(e) Subsection G(8) does not apply to the construction of one individual
single-family dwelling that is not part of a larger development on a lot
receiving preliminary or final subdivision approval on or before February 2,
2004, provided that the construction begins on or before February 2, 2009.

§ 358-5. Calculation of stormwater runoff and groundwater recharge.
A. Stormwater runoff shall be calculated in accordance with the following:
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(1) The design engineer shall calculate runoff using one of the following methods:

(a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 - Hydrology and Technical Release 55 - Urban Hydrology for Small Watersheds; or


(2) For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the preconstruction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology at § 358-5A(1)(a) and the Rational and Modified Rational Methods at § 358-5A(1)(b). A runoff coefficient or a groundwater recharge, land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover have existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).

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

(4) In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 - Urban Hydrology for Small Watersheds and other methods may be employed.

(5) If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.


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

(1) Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).

(2) Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than 1/3 the width of the diameter of the orifice or 1/3 the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of § 358-8D.

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

(4) At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of 2 1/2 inches in diameter.

(5) Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at § 358-8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized, provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by § 358-4 of this chapter.

C. Manufactured treatment devices may be used to meet the requirements of § 358-4 of this chapter, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

§ 358-7. Sources for technical guidance.

A. Technical guidance for stormwater management measures can be found in the documents listed at Subsection A(1) and (2) below, which are available from Maps and Publications,
Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.

The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

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

1. The "Standards for Soil Erosion and Sediment Control in New Jersey," promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the soil conservation districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each soil conservation district may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625; (609) 292-5540;

2. The Rutgers Cooperative Extension Service, 732-932-9306; and

3. The soil conservation districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each soil conservation district may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.


A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.

B. Requirements for trash racks, overflow grates and escape provisions.

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

(a) The trash rack shall have parallel bars, with no greater than six-inch spacing between the bars.

(b) The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
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(c) The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.

(d) The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 pounds per square foot.

(2) An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:

(a) The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.

(b) The overflow grate spacing shall be no less than two inches across the smallest dimension.

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

(3) For purposes of this Subsection B(3), escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:

(a) If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in § 358-8C a freestanding outlet structure may be exempted from this requirement.

(b) Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than 2 1/2 feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately 2 1/2 feet below the permanent water surface, and the second step shall be located one to 1 1/2 feet above the permanent water surface. See § 358-8D for an illustration of safety ledges in a stormwater management basin.

(c) In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or exemption from safety standards: A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

D. Illustration of safety ledges in a new stormwater management basin:
§ 358-9. Requirements for a site development stormwater plan. [Added 8-17-2006 by Ord. No. 2006-42]

A. Submission of site development stormwater plan.

(1) Whenever an applicant seeks municipal approval of a development subject to this chapter, the applicant shall submit all of the required components of the checklist for the site development stormwater plan at § 358-9C below as part of the submission of the applicant's application for subdivision or site plan approval.

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

(3) The applicant shall submit 20 copies of the materials listed in the checklist for site development stormwater plans in accordance with § 358-9C of this chapter.

B. Site development stormwater plan approval. The applicant's site development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the Planning and/or Zoning Board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this chapter.

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

(1) Topographic base map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of one inch equals 200 feet or greater, showing two-foot contour intervals. The map, as appropriate, may indicate
the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and man-made features not otherwise shown.

(2) Environmental site analysis. A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.

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

(4) Land use planning and source control plan. This plan shall provide a demonstration of how the goals and standards of §§ 358-3 through 358-6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

(5) Stormwater management facilities map. The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

(a) Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.

(b) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.

(6) Calculations.

(a) Comprehensive hydrologic and hydraulic design calculations for the predevelopment and postdevelopment conditions for the design storms specified in § 358-4 of this chapter.
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(b) When the proposed stormwater management control measures (e.g., infiltration basins) depends on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.

(7) Maintenance and repair plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of § 358-10.

(8) Waiver from submission requirements. The municipal official or board reviewing an application under this chapter may, in consultation with the Municipal Engineer, waive submission of any of the requirements in § 358-9C(1) through C(6) of this chapter when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.


A. Applicability. Projects subject to review as in § 358-1C of this chapter shall comply with the requirements of § 358-10B and C.

B. General maintenance.

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

(2) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

(3) Responsibility for maintenance shall not be assigned or transferred to the 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.

(4) If the person responsible for maintenance identified under § 358-10B(2) above is not a public agency, the maintenance plan and any future revisions based on § 358-10B(7) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
§ 358-12. Effective date. [Added 8-17-2006 by Ord. No. 2006-42]

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