Post-Sandy Planning

2017 Master Plan Reexamination

Borough of Moonachie

Bergen County New Jersey

Borough of Moonachie Master Plan Re-Examination

With new Resiliency Element

Planning documents appended to Master Plan Re- Examination include:

Neighborhood Plans for critical Planning areas inside the NJSEA District

Empire Boulevard Neighborhood Plan

Moonachie Avenue Neighborhood Plan

Zoning Ordinance Update (Recommended Revisions)

Flood Damage Prevention Ordinance Update

Design Standards and Guidelines for Resiliency

Debris Management Plan

Geographic Information System Data Base

(GIS) Report

GIS Online

Capital Improvement Plan

Prepared pursuant to *N.J.S.A. 40:55D-89* of the New Jersey Municipal Land Use Law

Adopted by the Moonachie Planning Board
May 18, 2017

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Grace Lynch AIA PP CID ALEP LEED-AP

Mayor Dennis Vaccaro

Council

Kathleen M. Kinsella, Council President
Robert Bauer — Antonio Cirillo
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Joyce Molinari, Chairperson
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Post-Sandy Planning
Master Plan Reexamination

Borough of Moonachie

BERGEN COUNTY
NEW JERSEY

PLANNERS
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May 18th, 2017

L+C DESIGN CONSULTANTS PA
ARCHITECTS PLANNERS ENGINEERS

Reexamination Report of the Master Plan

THE BOROUGH OF MOONACHIE

Prepared pursuant to *N.J.S.A. 40:55D-89* of the
New Jersey Municipal Land Use Law

Adopted by the Moonachie Planning Board
_____ 2017

Prepared by:

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A signed and sealed original copy is on file with the Borough Clerk's office

Appendix B2 – Flood Damage Prevention Ordinance

INTRODUCTION

Based on Master Plan Re-Examination report recommendations, and in conjunction with the Zoning Ordinance Update, the **Flood Damage Prevention Ordinance** has been revised to clarify goals of resiliency and review relevant State statutes, rules and regulations concerning stormwater management or flood control. It is recommended that this ordinance be reviewed and updated regularly as regulations may continue to change in response to the increasing threat of flood damage.

CHAPTER XIX FLOOD DAMAGE PREVENTION
Editor's Note: Prior ordinance history includes portions of Ordinance Nos. 82-6, 87-8, 91-1, 95-13 and prior 1970 Code §§20-1-205.

19-1 STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE, OBJECTIVES.

19-1.1 Statutory Authorization.

The Legislature of the State of New Jersey has in N.J.S.A. 40:48-1, et seq., delegated the responsibility to local governmental units to adopt regulations designed to promote public health, safety, and general welfare of its citizenry. Therefore, the Mayor and Council of the Borough of Moonachie, County of Bergen, State of New Jersey does ordain as follows. (Ord. #95-16, §1.0)

19-1.2 Findings of Fact.

a. The flood hazard areas of the Borough of Moonachie are subject to periodic inundation which results in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
b. These flood losses are caused by the cumulative effect of floodwater and obstructions in areas of special flood hazard which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or other-wise protected from flood damage also contribute to the flood loss. External conditions and obstructions in surrounding municipalities also impact the severity of flooding and subsequent flood losses within the Borough of Moonachie, which are not addressed in this ordinance.

(Ord. #95-16, §1.0)

19-1.3 Statement of Purpose.

It is the purpose of this Chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

a. To protect human life and health;
b. To minimize the use of pollutants and contaminants and reduce the risk of exposure to the environment;
c. To minimize expenditure of public money for costly flood control projects;
d. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
e. To minimize prolonged business interruptions;
f. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;
g. To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;
h. To insure that potential buyers are notified that property is in an area of special flood hazard; and
i. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

(Ord. #95-16, §1.0)

19-1.4 Methods of Reducing Flood Losses.

In order to accomplish its purposes, this Chapter includes methods and provisions for:

a. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
b. Requiring that uses vulnerable to floods including facilities which serve such uses, be protected against flood damage at the time of initial construction;
c. Ensuring that alterations, additions, renovations, and maintenance of structures and uses vulnerable to floods be protected against flood damage;
d. Controlling the alteration of natural flood plains, streams, channels, and natural protective barriers, which help accommodate or channel flood waters;
e. Controlling filling, grading, dredging, and other development which may increase flood damage; and,
f. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

(Ord. #95-16, §1.0)

19-2 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.

Appeal shall mean a request for a review of the Borough Administrator interpretation of any provision of this Chapter or a request for a variance.

Advisory Base Flood Elevation (ABFE) shall mean the elevation shown on a community's Advisory Flood Hazard Map that indicates the advisory stillwater elevation plus wave effect (ABFE = SWEL + wave effect) resulting from a flood that has a 1-percent or greater chance of being equaled or exceeded in any given year.

Advisory Flood Hazard Area (AFHA) shall mean the land in the floodplain within a community subject to flooding from the 1% annual chance event depicted on the Advisory Flood Hazard Map.

Advisory Flood Hazard Map shall mean the official map on which the Federal Emergency Management Administration has delineated the areas of advisory flood hazards applicable to the community.

Appeal shall mean a request for a review of the Borough's interpretation of any provision of this ordinance or a request for a variance.

Area of shallow flooding shall mean a designated AE zone on a community's Flood Insurance Rate Map (FIRM) with a one (1%) percent annual chance of flooding, for which Base Flood Elevations (BFEs) have been determined.

Area of special flood hazard shall mean the land in the flood plain within a community subject to a one (1%) percent or greater chance of flooding in any given year.

Base flood shall mean the flood having a one (1%) percent chance of being equaled or exceeded in any given year.

Basement shall mean any area of the building having its floor subgrade (below ground level) on all sides.

Breakaway wall shall mean a wall that is part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or supporting foundation system.

Cumulative Substantial Improvement shall mean any reconstruction, rehabilitation, addition, or other improvement of a structure that equals or exceeds 50 percent [lower threshold – e.g.: replace 50 percent with 40 percent] of the market value of the structure at the time of the improvement or repair when counted cumulatively for 10 years.

Design Flood Elevation (*DFE*) shall mean the elevation to which construction is regulated in the Borough of Moonachie; it is the base flood elevation (BFE) on the FIRM plus freeboard as described in Section 19-5.2.

Development shall mean any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials located within the area of special flood hazard.

Digital Flood Insurance Rate Map (DFIRM) shall mean the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

Elevated building shall mean a non-basement building (i) built in the case of a building in a Area of Special Flood Hazard to have the top of the elevated floor and (ii) adequately anchored so as not to impair the structural integrity of the building during a flood up to the magnitude of the base flood. In an Area of Special Flood Hazard "elevated building" also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of flood waters.

Flood or flooding shall mean a general and temporary condition of partial or complete inundation of normally dry land areas from:

a. The overflow of inland or tidal waters and/or
b. The unusual and rapid accumulation of runoff of surface waters from any source.

Flood Insurance Rate Map (FIRM) shall mean the official map on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

Flood Insurance Study (FIS) shall mean the official report provided in which the Federal Insurance Administration has provided flood profiles, as well as the Flood Boundary/Floodway Map and the water surface elevation of the base flood.

Flood plain management regulations shall mean zoning ordinances, subdivision regulations, building codes health regulations, special purpose ordinance (such as a flood plain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such State or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

Floodproofing shall mean any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway shall mean the channel of a river or other water course and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than 0.2 foot and shall reflect the intentions of the Borough Master Plan

Historic structure shall mean any structure that is:

a. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

b. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district preliminarily determined by the Secretary to qualify as a registered historic district.
c. Individually listed on a State inventory of historic places in states with historic preservation programs which have been approved by the Secretary of the Interior; or
d. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
    1. By an approved State program as determined by the Secretary of the Interior; or
    2. Directly by the Secretary of the Interior in states without approved programs.

Impervious Surface in watershed management terms shall mean a surface that prohibits the movement of water from the land surface into the underlying soil or dirt. Buildings and paved surfaces (e.g., asphalt, concrete) are considered impervious covers.

Lowest floor shall mean the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for the parking of vehicles, building access or storage in an area other than a basement is not considered a buildings' lowest floor provided that such enclosure is not built so to render the structure in violation of other applicable non-elevation design requirements.

Manufactured home shall mean a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" includes mobile homes, park trailers, travel trailers and similar transportable structures that are placed on a site for 180 consecutive days or longer, but does not include a "recreational vehicle".

Manufactured home park or *manufactured home subdivision* shall mean a parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

New construction shall mean structures for which the start of construction commenced on or after the effective date of a flood plain regulation adopted by a community and includes any subsequent improvements to such structures.

New manufactured home park or subdivision shall mean a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of the flood plain management regulations adopted by the municipality.

Recreational vehicle shall mean a vehicle which is (i) built on a single chassis; (ii) four hundred (400) square feet or less when measured at the longest horizontal projections; (iii) designed and to be self-propelled or permanently towable by a light duty truck; and (iv) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Start of construction shall mean and include substantial improvements and shall mean the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site such as the pouring of a slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation, or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling nor does it include the installation of streets and/or walkways, nor does it include excavation for a basement, footing or piers, or foundations or the erection of temporary forms, nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structures. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration effects the external dimensions of the building.

Structure shall mean a walled and roofed building, a manufactured home, or a gas or liquid storage tank that is principally above ground.

Substantial damage shall mean damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty (50%) percent of the market value of the structure before the damage occurred, based on the Federal Emergency Management Agency (FEMA), Uniform Construction Code (UCC), and International Building Code (IBC) standards.

Substantial improvement shall mean any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which exceeds fifty (50%) percent of the market value of the structure before the "start of construction" of the improvement, based on the Federal Emergency Management Agency (FEMA), Uniform Construction Code (UCC), and International Building Code (IBC) standards. The term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however include either:
a. Any project for improvement of a structure to correct existing violations of State or local health, sanitary or safety codes specifications which have been identified by the local code enforcement officer and which are the minimum necessary to assure safe living conditions; or
b. Any alteration of a "historic structure", provided the alteration will not preclude the structure's continued designation as a "historic structure".

Variance shall mean a grant of relief from the requirements of this Chapter which permits construction in a manner that would otherwise be prohibited by this Chapter.

(Ord. #95-16, §2.0)

19-3 GENERAL PROVISIONS.

19-3.1 Lands to Which This Chapter Applies.

This Chapter shall apply to all areas of special flood hazards within the jurisdiction of Borough of Moonachie. (Ord. #95-16, §3.0)

19-3.2 Basis for Establishing the Areas of Special Flood Hazard.

The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study of Bergen County, New Jersey" with accompanying Flood Insurance Rate Maps Panels 256 and 258 of 332 dated September 30, 2005 is hereby adopted by reference and declared to be part of this Chapter. The Flood Insurance Study is on file with the Borough Clerk. (Ord. #95-16, §3.0; Ord. #2005-7)

19-3.3 Penalties for Noncompliance.

No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this ordinance and other applicable regulations. Violation of the provisions of this Chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this Chapter or fails to comply with any of its requirements shall upon conviction thereof be fined not more than one thousand ($1,000.00) dollars or imprisoned for not more than ninety (90) days or both, for each violation, and in addition shall pay all costs and expenses involved in the case. Nothing herein contained shall prevent the construction official of the Borough of Moonachie from taking such other lawful action as is necessary to prevent or remedy any violation. (Ord. #95-16, §3.0)

19-3.4 Abrogation and Greater Restrictions.

This Chapter is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this Chapter and other ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail. (Ord. #95-16, §3.0)

19-3.5 Interpretation.

In the interpretation and application of this Chapter, all provisions shall be:

a. Considered as minimum requirements;
b. Liberally construed in favor of the governing body; and
c. Deemed neither to limit nor repeal any other powers granted under State statutes.

(Ord. #95-16, §3.0)

19-3.6 Warning and Disclaimer of Liability.

The degree of flood protection required by this Chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This Chapter does not imply that land outside the area of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. It is imperative that property owners familiarize themselves with current codes and statutes.

This Chapter shall not create liability on the part of Mayor and Council, any officer or employee thereof or the Federal Insurance Administration, for any flood damages that result from reliance on this Chapter or any administrative decision lawfully made thereunder. (Ord. #95-16, §3.0)

19-4 ADMINISTRATION.
19-4.1 Establishment of Development Permit.

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in subsection 19-3.2. Application for a development permit shall be made on forms furnished by the Mayor and Council and may include, but not be limited to; plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing.

Specifically, the following information is required;

a. Elevation in relation to mean sea level, of the lowest floor (including basement) of all structures;
b. Elevation in relation to mean sea level to which any structure has been floodproofed.
c. Certification by a registered professional engineer or architect that the floodproofing methods of any nonresidential structure meet the floodproofing criteria in subsection 19-5.2b; and,
d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

(Ord. #95-16, §4.0)

19-4.2 Designation of the Enforcement.

The Borough Construction Official is hereby appointed to administer and implement this Chapter by granting or denying development permit applications in accordance with its provisions. (Ord. #95-16, §4.0)

19-4.3 Duties and Responsibilities of the Borough Construction Official.

Duties of the Borough Construction Official shall include, but not be limited to:

a. *Permit Review*.
    1. Review all development permits to determine that the permit requirements of this Chapter have been satisfied.
    2. Review all development permits to determine that all necessary permits have been obtained from those Federal, State or local governmental agencies from which prior approval is required.
    3. Review all development permits to determine if the proposed development is located in the floodway, assure that the encroachment provisions of subsection 19-5.3a are met.

b. *Use of Other Base Flood and Floodway Data*. When base flood elevation and floodway data has not been provided in accordance with subsection 19-3.2, Basis for Establishing the Areas of Special Flood Hazard, the Borough Construction Official shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a Federal, State or other source, in order to administer subsections 19-5.2a, Specific Standards, Residential Construction, and 19-5.2b, Specific Standards, Nonresidential Construction.

c. *Information to Be Obtained and Maintained*.
    1. Obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basement) of all new or substantially improved structures, and whether or not the structure contains a basement.
    2. For all new or substantially improved floodproofed structures:
        a) Verify and record the actual elevation (in relation to mean sea level); and
        b) Maintain the floodproofing certifications required in subsection 19-4.1c.
        c) Maintain for public inspection all records pertaining to the provisions of this Chapter.

d. *Alteration of Watercourses*.
    1. Notify adjacent communities and the (State coordinating agency) prior to any alteration or relocating of a watercourse, and submit evidence of such notification to the Federal Insurance Administration.
    2. Require that maintenance is provided within the altered or relocated portion of said watercourse so the flood carrying capacity is not diminished.

e. Interpretation of FIRM Boundaries. Make interpretation where needed, as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual filed conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in subsection 19-4.4.

(Ord. #95-16, §4.0)

19-4.4 Variance Procedure.

a. *Appeal Board*.
    1. The Board of Adjustment as established by the Borough of Moonachie shall hear and decide appeals and request for variances from the requirements of this Chapter or the applicable jurisdictional agency.
    2. The Board of Adjustment shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the Borough Building Official in the enforcement or administration of this Chapter.
    3. Those aggrieved by the decision of the Board of Adjustment or any taxpayer, may appeal such decision to the Superior Court, as provided in N.J.S.A. 45:55D-17.
    4. In passing upon such applications, the Board of Adjustment, shall consider all technical evaluations, all relevant factors, standards specified in other sections of this ordinance, and;
        a) The danger that materials may be swept onto other lands to the injury of others.
        b) The danger to life and property due to flooding or erosion damage.
        c) The compliance with floodplain management regulations and susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
        d) The importance of the services provided by the proposed facility to the community;
        e) The necessity to the facility of a waterfront location, where applicable;
        f) The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
        g) The compatibility of the proposed use with existing and anticipated development;
        h) The relationship of the proposed use to the comprehensive plan and flood plain management program of that area;
        i) The safety of access to the property in times of flood for ordinary and emergency vehicles;
        j) The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
        k) The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

5. Upon consideration of the factors of subsection 19-4.4a,4 and the purpose of this Chapter, the Board of Adjustment may attach such conditions to the granting of variances as it deems necessary to further the purposes of this Chapter.
6. The Borough Building Official shall maintain the records of all appeal actions, including technical information, and report any variances to the Federal Insurance Administration upon request.

b. Conditions for Variances.

1. Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half (1/2) acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items (a) through (k) in subsection 19-4.4a,4 have been fully considered. As the lot size increases beyond the one-half (1/2) acre, the technical justification required for issuing the variance increases.
2. Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.
3. Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.
4. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
5. Variances shall only be issued upon:
    a) A showing of good and sufficient cause;
    b) A determination that failure to grant the variance would result in exceptional hardship to the applicant; and,
    c) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public as identified in subsection 19-4.4a,4, or conflict with existing local laws or ordinances.
6. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

(Ord. #95-16, §4.0)

19-5 PROVISIONS FOR FLOOD HAZARD REDUCTION.

19-5.1 General Standards.

In all areas of special flood hazards the following standards are required.

a. *Anchoring*.
    1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.
    2. All new and replacement manufactured homes to be placed or substantially improved in a flood hazard area shall be installed using methods and practices that minimize flood damage. Manufactured homes shall be securely anchored to resist flotation, collapse or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.

b. *Construction Materials and Methods*.
    1. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
    2. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters;
    3. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding; and
    4. Electrical, heating, ventilation, plumbing and air-conditioning equipment and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

c. *Utilities*.
    1. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
    2. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters;
    3. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding; and
    4. For all new construction and substantial improvements the electrical, heating, ventilation, plumbing and air-conditioning equipment and other service facilities shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

d. Subdivision Proposals.
    1. All subdivision proposals shall be consistent with the need to minimize flood damage;
    2. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage; and
    3. All subdivision proposals shall have adequate drainage connections or a slope to drainage provided to reduce exposure to flood damage; and

4. Base flood elevation data shall be provided for subdivision proposals and other proposed development which contain at least fifty (50) lots of five (5) acres (whichever is less).

e. *Enclosure Openings*. For all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria: A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one (1') foot above grade. Openings may be equipped with screens, louvers, or other covering or devices provided that they permit the automatic entry and exit of floodwaters.

(Ord. #95-16, §5.0)

19-5.2 Specific Standards.

In all areas of special flood hazards where base flood elevation data have been provided as set forth in subsection 19-3.2, Basis for Establishing the Areas of Special Flood Hazard or in subsection 19-4.3b, Use of Other Base Flood Data, the following standards are are in accordance with the State of New Jersey Flood Damage Prevention Ordinance (60.3) and the 2015 International Building Code prepared by FEMA[1] and are required:

a. *Residential Construction*. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement together with the attendant utilities and sanitary facilities, elevated to or above base flood elevation or advisory base flood elevation whichever is more restrictive, plus two feet (DFE) or more;

b. *Nonresidential Construction*. New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall have the lowest floor, including basement together with the attendant utilities and sanitary facilities: *Either*
   1. Elevated to or above the base flood elevation or advisory base flood elevation whichever is more restrictive, plus two feet (DFE) or more; or
   2. Be floodproofed so that below the base flood level plus two feet or more. or advisory base flood elevation plus two feet (DFE) or more, (whichever is more restrictive) the structure is watertight with walls substantially impermeable to the passage of water; or
   3. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and,
   4. Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting the applicable provisions of this subsection. Such certification shall be provided to the official as set forth in subsection 19-4.3c,2.

c. *Manufactured Homes*.
   1. Manufactured homes shall be anchored in accordance with subsection 19-5.1a,2.
   2. All manufactured homes to be placed or substantially improved within an area of special flood hazard shall be elevated on a permanent foundation such that the top of the lowest floor is at or above the base flood elevation or advisory base flood elevation, plus two feet or more (whichever is more restrictive).

(Ord. #95-16, §5.0)

19-5.3 Encroachments.

The cumulative effect of any proposed development, when combined with all other existing and anticipated development shall not increase the water surface elevation of the base flood more than two tenths (0.2) foot any point. (Ord. #95-16, §5.0)

19-6 STORMWATER CONTROL.

19-6.1 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 Best Management Practices (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. Flood control measures should be developed with consideration to the recommendations of the Rebuild By Design – Meadowlands Project.

b. *Purpose*. It is the purpose of this section to establish minimum stormwater management requirements and controls for "major development," as defined in subsection 19-6.2.

c. *Applicability*.
   1. This section 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

[1] 2015 IBC (prepared October 1, 2015, with errata). International Code Council, Inc. https://www.fema.gov/media-library-data/1446030649587-10e447987a16b1313253361ed0871a46/2015_Icodes_Flood_Provisions_508_v2.pdf

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

2. This section shall also be applicable to all major developments undertaken in the Borough of Moonachie.

d. *Compatibility with Other Permit and Ordinance Requirements.* Development approvals issued for subdivisions and site plans pursuant to this section 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 section shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This section 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 section 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.

(Ord. #2006-1, §1)

19-6.2 Definitions.

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

Compaction shall mean the increase in soil bulk density.

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

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:

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

Department shall mean the New Jersey Department of Environmental Protection.

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

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.

Development shall mean the division of a parcel of land into two (2) 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 shall mean a geographic area within which stormwater runoff, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

Environmentally constrained area means the following areas where the physical alteration of the land is in some way restricted, either through regulation, easement, deed restriction or ownership such as: wetlands, floodplains, threatened and endangered species sites or designated habitats, and parks and preserves. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

Environmentally critical areas 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 species; large areas of contiguous open space or upland forest; steep slopes; and well head protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

Erosion shall mean the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

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 water seeps into the soil from precipitation.

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

Major development shall mean any development that provides for ultimately disturbing one (1) 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 shall mean any city, borough, town, township, or village.

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

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

Person shall mean any individual, corporation, company, partnership, firm, association, the Borough of Moonachie, 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 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 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 shall mean the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

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.

State Development and Redevelopment Plan Metropolitan Planning Area (PA1) shall mean 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 shall mean 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 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 runoff shall mean water flow on the surface of the ground or in storm sewers, resulting from precipitation.

Stormwater management basin shall mean 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 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 nonstormwater discharges into stormwater conveyances.

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

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

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 Enterprise Zone shall mean 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 shall mean previously developed portions of areas:

1. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
2. Designated as CAFRA Centers, Cores or Nodes;
3. Designated as Urban Enterprise Zones; and

Waters of the State shall mean 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 shall mean 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.
(Ord. #2006-1, §2)

19-6.3 General Standards.

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 subsection 19-6.4. 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.
    2. The standards in this section 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.

(Ord. #2006-1, §3)

19-6.4 Stormwater Management Requirements for Major Development.

a. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards at N.J.A.C. 7:8-5.4 and 5.5. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies at N.J.A.C. 7:8-5.3 into the design. If these measures alone are not sufficient to meet these standards, structural stormwater management measures at N.J.A.C. 7:8-5.7 necessary to meet these standards shall be incorporated into the design.
b. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with subsection 19-6.10.
c. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlnebergi* (bog turtle).
d. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of subsection 19-6.4 g. and h.
    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 fourteen (14') feet, provided that the access is made of permeable material.
e. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of subsection 19-6.4g. and h. may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
    1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
    2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of subsection 19-6.4g. and h. to the maximum extent practicable;
    3. The applicant demonstrates that, in order to meet the requirements of subsection 19-6.4g. and h., existing structures currently in use, such as homes and buildings, would need to be condemned; and
    4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under paragraph e,3. above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of subsection 19-6.4f. and g. that were not achievable on site.
f. *Nonstructural Stormwater Management Strategies.*
    1. To the maximum extent practicable, the standards in subsection 19-6.4g. and h. shall be met by incorporating nonstructural stormwater management strategies set forth at subsection 19-6.4f. 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 post-construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;
    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 subsection 19-6.4e,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
        4) When establishing vegetation after land disturbance, applying non-toxic 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.
3. Site design features identified under subsection 19-6.4f,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 subsection 19-6.4f,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 seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension. Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
    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 (2) or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0") inches across the smallest dimension.
    c) This standard does not apply:
        1) 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;
        2) Where flows from the water quality design storm as specified in subsection 19-6.4g,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 (1) of the following:
            a. A rectangular space four and five-eighths (4 5/8") inches long and one and one-half (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 (1") inch spacing between the bars, to the elevation of the water quality design storm as specified in subsection 19-6.4g,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 subsection 19-6.4f. and g. shall meet one (1) of the following requirements:
    a) Be dedicated to a government agency as approved by the appropriate reviewing agency, or

b) Subjected to a conservation restriction filed with the appropriate County Clerk's office, or
c) Subjected to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.

5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in subsection 19-6.7 or found on the Department's website at www.njstormwater.org.

g. *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 subsection 19-6.5, either;

a. Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain one hundred (100%) percent of the average annual preconstruction groundwater recharge volume for the site; or

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

2) This groundwater recharge requirement does not apply to projects within the urban redevelopment area, 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.

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 down gradient 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 subsection 19-6.5, complete one (1) of the following:

1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the 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 2-, 10-, and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

3) Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10-, and 100-year storm events are 50, 75 and 80 percent, respectively, of the preconstruction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. 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 paragraphs (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 subsection 19-6.2 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.

h. *Stormwater Runoff Quality Standards*.

1. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by eighty (80%) percent 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 one-quarter (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 one and one-quarter (1.25") inches of rainfall in two (2) 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 non-structural and structural stormwater management measures.

Table 1: Water Quality Design Storm Distribution

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	0.0550	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		

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 subsection 19-6.7, or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in subsection 19-6.7. 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. Where the Department is not 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 (1) 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 – (AxB)/100
Where
R = total TSS percent load removal from application of both BMPs, and
A = the TSS percent removal rate applicable to the first BMP
B = the TSS percent removal rate applicable to the second BMP

Table 2: TSS Removal Rates for BMPs

Best Management Practice	TSS Percent Removal Rate
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured treatment Device	See subsection 19-6.6A, c

Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one (1) on-site drainage area, the eighty (80%) 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 post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in subsection 19-6.4g. and h.
6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in subsection 19-6.7.
7. In accordance with the definition of FW1 at N.J.A.C. 7:9B-l.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.
8. 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 (1) of the following:
        1) A three hundred (300) 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 centerline 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 paragraph (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 one hundred fifty (150') feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this paragraph 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 one hundred fifty (150') feet of the Category One waterway;
        2) Stormwater associated with discharges allowed by this section shall achieve a ninety-five (95%) percent TSS post-construction 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 subsection 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 subsection 19-6.4g,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 paragraph g,8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in paragraph 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 one hundred fifty (150') feet as measured perpendicular to the waterway subject to this subsection.

e) Paragraph g,8 does not apply to the construction of one (1) 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.

(Ord. #2006-1, §4)

19-6.5 Calculation of Stormwater Runoff and Groundwater Recharge.

a. Stormwater runoff shall be calculated in accordance with the following:
   1. The design engineer shall calculate runoff using one (1) 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
      b) The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.
   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 subsection 19-6.5a,1(a) and the Rational and Modified Rational Methods at subsection 19-6.5a,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 (5) years without interruption prior to the time of application. If more than one (1) 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. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).
   3. In computing preconstruction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce preconstruction stormwater runoff rates and volumes.
   4. In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55 – Urban Hydrology for Small Watersheds and other methods may be employed.
   5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

b. Groundwater recharge may be calculated in accordance with the following:
   1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at http://www.state.nj.us/dep/njgs/; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427, Trenton, New Jersey, 08625-0427; (609) 984-6587.

(Ord. #2006-1, §5)

19-6.6A Standards for 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 (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 parallel bars at the outlet structure shall be spaced no greater than one-third (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one (1") inch and a maximum spacing between bars of six (6") inches. In addition, the design of trash racks must comply with the requirements of subsection 19-6.8b.
   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 two and one-half (2 1/2"') inches in diameter.
   5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at subsection 19-6.8.

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 subsection 19-6.4 of this section.

c. Manufactured treatment devices may be used to meet the requirements of subsection 19-6.4 of this section, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

(Ord. #2006-1, §6A; Ord. #2007-8)

19-6.6B Nonstructural Stormwater Strategies.

a. *Buffers*. Buffer areas are required along all lot and street lines separating residential uses from arterial and collector streets, separating a nonresidential use from either a residential use or residential zoning district line, and long all street lines where loading and storage areas can be seen from the street. The buffer area shall use native vegetation, which requires less fertilization and watering than non-native species. Buffer areas may be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. Preservation of natural wood tracts and limiting land disturbance for new construction must be incorporated where practical.

b. *Curbs and Gutters*. Curb cuts or flush curbs with curb stops are encouraged where practical to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas where practical.

c. *Drainage Systems*. An existing ordinance may require that all streets be provided with inlets and pipes where the same are necessary for proper drainage. The use of natural vegetated swales in lieu of inlets and pipes are encouraged where practical.

d. *Driveways and Access Ways*. The use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge should be considered for driveways and access ways where practical. Consideration should be given for subsurface soil conditions. The use of crowned driveways is also encouraged to promote disconnectivity between impervious surfaces and grass areas to promote groundwater recharge.

e. *Natural Features*. Natural features, such as trees, brooks, swamps, hilltops, and views, are to be preserved whenever possible, and that care be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area. In addition, forested areas shall be maintained to ensure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees.

f. *Nonconforming Uses, Structures or Lots*. The existing ordinance may allow an applicant/owner of an existing use to propose additions or alterations that exceed the permitted building and/or lot coverage percentages. The applicant should mitigate the impact of the additional impervious surfaces unless the stormwater management plan for the development provided for these increases in impervious surfaces. This mitigation effort must address water quality, flooding and groundwater recharge.

g. *Off-site and Off-tract Improvements*. Any off-site and off-tract stormwater management and drainage improvements must conform to the design and performance standards described.

h. *Off-street Parking and Loading*. Parking lots with more than ten (10) spaces and all loading areas should allow for flush curb with curb stop, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. The use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers should be utilized where practical. A developer may demonstrate that fewer spaces would be required, provided area is set aside for additional spaces if necessary. Pervious paving could be provided for overflow parking areas.

i. *Performance Standards*. This section can provide for pollution source control and must be evaluated in order to prohibit materials or wastes from being deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation or wind. Materials and wastes that might create a pollutant or a hazard shall be enclosed in appropriate containers.

j. *Shade Trees*. The existing ordinance may require a minimum of shade trees per lot to be planted in the front yard. In addition to this subsection, the Borough may have a Tree Preservation Ordinance that restricts and otherwise controls the removal of mature trees throughout the Borough. This section should recognize that the preservation of mature trees and forested areas must be considered in the management of environmental resources, particularly watershed management, air quality, and ambient heating and cooling. A critical disturbance area that extends beyond the driveway and building footprint where clearing of trees cannot occur shall be depicted on the plan minimizing land disturbance. Identification of forested areas and the percentage of wooded areas to be protected from disturbance shall also be provided.

k. *Sidewalks*. Sidewalks should be designed to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces or use permeable paving materials where appropriate.

l. *Soil Erosion and Sediment Control*. The applicant shall comply with the New Jersey Soil Erosion and Sediment Control Standards and should incorporate signs to retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

Further guidance on the implementation of these strategies can be found in the NJDEP Stormwater Best Management Practices Manual, April 2004, as amended.

(Ord. #2006-1, §6B; Ord. #2007-8)

19-6.7 Sources for Technical Guidance.

a. Technical guidance for stormwater management measures can be found in the documents listed at paragraphs 1 and 2 below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey, 08625; telephone (609) 777-1038.

    1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as: bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins,

infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.

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

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

1. The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;
2. The Rutgers Cooperative Extension Service, 732-932-9306; and
3. The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)4. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey, 08625, (609) 292-5540.

(Ord. #2006-1, §7)

19-6.8 Safety Standards for Stormwater Management Basins.

a. This subsection 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. The provisions of this subsection do not preempt more stringent municipal or County safety requirements for new or existing stormwater management basins. Municipal and County stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management basins to be retrofitted to meet one or more of the safety standards in subsections 19-6.8b,1, 2 and 3 for trash racks, overflow grates, and escape provisions at outlet structures.

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 managem ent 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 (6") inch spacing between the bars.
    b) The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
    c) The average velocity of flow through a clean trash rack is not to exceed two and one-half (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 three hundred (300) lbs./ft. sq.
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 (2") 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 three hundred (300) lbs./ft. sq.
3. For purposes of this paragraph 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 subsection 19-6.8c. 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 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 (1) 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') to one and one-half (1 1/2') feet above the permanent water surface. See subsection 19-6.8d. for an illustration of safety ledges in a stormwater management basin.
    c) In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

c. *Variance or Exemption from Safety Standards*.

1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (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*.

(Ord. #2006-1, §8)

19-6.9 Requirements for a Site Development Stormwater Plan.

a. *Submission of Site Development Stormwater Plan*.

1. Whenever an applicant seeks municipal approval of a development subject to this section, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at subsection 19-6.9c. 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 section.
3. The applicant shall submit the requisite number of copies of the materials listed in the checklist for site development stormwater plans in accordance with subsection 19-6.9c. of this section.

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 section.

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 two hundred (200') feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map as appropriate may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and flood plains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing manmade structures, roads, bearing and distances of property lines, and significant natural and manmade features not otherwise shown.
2. Environmental Site Analysis. A written and graphic description of the natural and manmade 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 subsections 19-6.3 through 19-6.6 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 post-development conditions for the design storms specified in subsection 19-6.4 of this section.
    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 subsection 19-6.10.
8. Waiver from Submission Requirements. The municipal official or board reviewing an application under this section may, in consultation with the Municipal Engineer, waive submission of any of the requirements in subsections 19-6.9c,1 through 6 of this section 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.

(Ord. #2006-1, §9; Ord. #2007-8)

19-6.10 Maintenance and Repair.

a. Applicability.
1. Projects subject to review as in subsection 19-6.1c. of this section shall comply with the requirements of subsections 19-6.10b. 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 include the following:

a) Contain specific preventative maintenance tasks and schedules; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement).
b) 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. The property owner of any property within the Borough's Conservation Overlay Zone shall be protected and maintained in accordance with the Property Maintenance Ordinance XI.
5. If the person responsible for maintenance identified under subsection 19-6.10b,2 above is not a public agency, the maintenance plan and any future revisions based on subsection 19-6.10b,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.
6. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
7. The person responsible for maintenance identified under subsection 19-6.10b,2 above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.
8. The person responsible for maintenance identified under subsection 19-6.10b,2 above shall evaluate the effectiveness of the maintenance plan at least once per year. Any adjustments to the management plan or deed shall require notification and approval from the applicable board prior to the filing of a revised deed.
9. The person responsible for maintenance identified under subsection 19-6.10b,2 above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by subsection 19-6.10b, 6 and 7 above.
10. The requirements of subsection 19-6.10b,3 and 4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.
11. In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have fourteen (14) days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

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

(Ord. #2006-1, §10)

19-6.11 Penalties.

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

a. First offense up to one thousand ($1,000.00) dollar fine or six (6) months in jail.
b. Second offense or any subsequent offense up to one thousand two hundred fifty ($1,250.00) dollar fine or six (6) months in jail.

(Ord. #2006-1, §11)

19-6.12 Enforcement.

The provisions of this section shall be enforced by the Moonachie Construction Code Official of the Borough of Moonachie. (Ord. #2006-1, §12 and Property Maintenance Ordinance XI)

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