ORDINANCE NO. 3607

AN ORDINANCE TO AMEND THE MUNICIPAL CODE OF THE TOWNSHIP OF FRANKLIN, COUNTY OF SOMERSET, STATE OF NEW JERSEY BY ADDING A NEW CHAPTER 330, TO BE ENTITLED STORMWATER MANAGEMENT, WHICH CHAPTER PROVIDES STORMWATER CONTROL REGULATIONS AND PENALITIES FOR VIOLATION OF THE CHAPTER.

SUMMARY

An Ordinance that provides for the regulations of Stormwater Control for the Township of Franklin and the penalties for the violation of the Chapter.

BE IT ORDAINED by the Township Council of the Township of Franklin, Somerset County as follows:

SECTION I

The Municipal Code of the Township of Franklin, County of Somerset, State of New Jersey is hereby amended by adding a new chapter, to be Chapter 330, Stormwater Management, to read as follows:

ARTICLE I
Scope and Purpose

§ 330-1. Scope of Authority

These regulations are adopted pursuant to the power and authority vested through the New Jersey Department of Environmental Protection (NJDEP), N.J.A.C. 7:8 and other applicable laws and statutes of the State of New Jersey.

§ 330-2. Findings of Fact

It has been determined that:

1. Waterbodies, roadways, structures and other property within, and downstream of Franklin Township are at times subject to flooding;

2. Flooding is a danger to the lives and property of the public and is also a danger to the natural resources of the municipality and the region;

3. Land development projects and activities alter the hydrologic response of watersheds resulting in increased stormwater runoff rates and volumes, increased flooding, increased stream channel erosion, and increased sediment transport and deposition;

4. Stormwater runoff produced by the land development contributes to increased quantities of water-borne pollutants;

5. Increases of stormwater runoff, soil erosion, stream channel erosion and non-point source pollutants have occurred in the past as a result of land development, and have resulted in the deterioration of the water resources of Franklin Township and downstream municipalities;

6. Increased stormwater runoff rates and volumes, and the sediments and pollutants associated with stormwater runoff, from future development projects within Franklin Township, have the potential to adversely affect the municipality's streams and water resources, and the streams and water resources of downstream municipalities;

7. Improperly managed and treated runoff impacts the biota of the Township's aquatic and wetland resources. This includes threatened and endangered species

as documented in the Department Landscape Project or Natural Heritage Database established under the N.J.S.A 13:1B-15.147 through 15.150;

8. Pollutants associated with stormwater runoff are responsible for the eutrophication of the Township's lakes and ponds;

9. Stormwater runoff, soil erosion and nonpoint source pollution can be controlled and minimized by the regulation of stormwater runoff from development projects;

10. The State of New Jersey's Surface Water Quality Standards (*N.J.A.C*. 7:9B-1.1 *et seq.*) establish surface water quality standards and antidegradation policies applicable to all surface waters of the state and these standards and antidegradation policies provide reasonable guidance to New Jersey municipalities for the regulation of stormwater runoff for purposes of protecting surface water resources from degradation.

It is therefore determined that it is in the best public interest to regulate the discharge of stormwater runoff from land development projects and other construction activities, as provided in this ordinance, in order to control and minimize increases in stormwater runoff and volumes and to control and minimize soil erosion, and nonpoint source pollution associated with stormwater runoff.

§ 330-3. Purpose

It is the purpose of this ordinance to promote the public health, safety, and general welfare of the citizens of Franklin Township; these Stormwater Management Regulations are hereby enacted for the general purpose of assuring the proper balance between man's use of land and the preservation of a safe and beneficial environment. More specifically, to explore the use of nonstructural or low impact techniques involving flood control, groundwater recharge, and pollutant reduction, before relying on structural Best Management Practices (BMP's). Structural BMP's should be integrated with nonstructural stormwater management strategies and proper maintenance plans. To be accomplished through the approval of Stormwater Management Plans pursuant to the provisions of these regulations, which:

1. To reduce artificially induced flood damage to public health, life and property;
2. To minimize increased stormwater runoff rates and volumes from any new land development;
3. To minimize the deterioration of existing watercourses, culverts and bridges, dams and other structures;
4. To preserve and maintain baseflow conditions of streams and rivers;
5. To maintain the adequacy of existing and proposed culverts and bridges, dams and other structures;
6. To induce water recharge into the ground where geologically favorable conditions exist;
7. To prevent an increase in nonpoint source pollution;
8. To maintain the integrity of stream channels for their biological functions, as well as for drainage and other purposes;
9. To minimize the impact of development upon streambank and streambed stability;
10. To reduce erosion from any development or construction project;
11. To minimize the increase in pollutants in runoff due to land development, which otherwise would degrade the quality of water and may render it both unfit for human consumption and detrimental to biological life;
12. To preserve and protect water supply facilities and water resources by means of controlling increased flood discharges, stream erosion, and runoff pollution;
13. To reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, from lands that were developed without stormwater management controls meeting the purposes and standards of this ordinance; and
14. To minimize public safety hazards at any stormwater detention facility constructed pursuant to subdivision or site plan approval.

§ 330-4. Applicability

A. This ordinance shall be applicable to all site plans and subdivisions for the following major developments (as defined in Section 2) that require preliminary or final site plan or subdivision review:

1. Non residential major developments; and
2. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C.5: 21-1.1, *et seq*.

B. This ordinance shall also be applicable to all major developments undertaken by Franklin Township.

§330-5. Compatibility with other Permit and Ordinance Requirements

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of the of the 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 and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety and welfare.

This ordinance is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this ordinance imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

ARTICLE II
Definitions

§ 330-6. Definitions

Unless specifically defined below, or in the Municipal Land Use Law (*N.J.S.A.* 40:55D-1 *et seq.*), Residential Site Improvement Standards (*N.J.A.C. 5:21-1.3 et seq.*), in the Soil Erosion and Sediment Control Act (*N.J.S.A.* 40:44D-1 *et seq.*) or in New Jersey's Stormwater Management Rules (*N.J.A.C.* 7:8-1.2 *et seq*.), the State Flood Control Facilities Act (N.J.S.A. 58:16A *et seq.*), or the NJDEP Flood Hazard Area Control Act Rules (N.J.A.C. 7:13 *et seq*.) words or phrases used in this ordinance shall be interpreted so as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

BASEFLOW - the portion of stream flow that is not due to storm runoff, and is supported by groundwater seepage into a channel.

BMP - best management practice

CHANNEL – means any natural or man-made waterway or course through which a constant or intermittent flow of water is conveyed.

DETENTION BASIN – a stormwater management basin or alternative structure designed to temporarily detain stormwater runoff.

DEVELOPMENT - The division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation of enlargement of any building or other structure, or any mining, excavation or landfill, and any use of land for which permission may be required pursuant to this ordinance.

DRAINAGE - The removal of surface water or groundwater from land by drains, grading, or other means and control of runoff during and after construction or development to minimize erosion and sedimentation, to assure the adequacy of existing and proposed culverts and bridges, to induce water recharge into the ground where practical, to lessen nonpoint pollution, to maintain the integrity of the stream channels for their biological functions as well as for drainage, and the means necessary for water supply preservation or prevention or alleviation of flooding.

DRAINAGE AREA – a geographic area within which stormwater runoff, sediments or dissolved materials drain into a particular receiving waterbody or to a particular point along a receiving waterbody.

DRY WELL - a below-grade stormwater retention structure that is open at the base, allowing water to percolate to the underlying soils.

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

FLOOD HAZARD AREA - the floodway and flood fringe areas as determined by the Department of Environmental Protection under the "State Flood Control Facilities Act", N.J.S.A 58:16A.

FLOOD PLAIN – the area inundated by the regulatory flood including the watercourse that creates it.

FLOODWAY - the channel and portions of the flood plain adjoining the channel which are reasonably required to and discharge the regulatory flood. For this ordinance, the term floodway refers to both the delineated floodway on State Adopted Studies and the area between the encroachment lines located on both sides of a non-delineated watercourse.

FRESHWATER WETLANDS - 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; provided, however, that in designating a wetland, *the delineator* shall use the three parameter approach (that is, hydrology, soils and vegetation) enumerated in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands. Freshwater Wetland has been defined here using the same definition as New Jersey Department of Environmental Protection (NJDEP) utilizes in its Technical Manual for Land Use Regulation Program (LURP).

INFILTRATION – is the process by which water seeps into the soil from precipitation.

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

NONPOINT SOURCE POLLUTION - a contamination of ground water, waterways, and oceans that results from everyday activities such as fertilizing the lawn, walking pets, changing motor oil and littering. With each rainfall, pollutants generated by these activities are washed into storm drains that flow into our waterways and ocean. They also can soak into the ground contaminating the ground water below.

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

PERVIOUS SURFACE – any surface that allows surface water to infiltrate to the underlying soils which may include paving materials (including pervious interlocking concrete paving blocks), concrete grid pavers, perforated brick pavers, and compacted gravel.

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

POROUS ASPHALT – asphalt or concrete that eliminates the fine aggregate typically used in conventional asphalt, creating voids which yield a higher rate of infiltration.

RECHARGE - the replenishment of underground water reserves.

STORMWATER RUNOFF - flow on the surface of the ground, resulting from precipitation.

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

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

TOTAL SUSPENDED SOLIDS – Per the NJDEP, TSS means the total nonfilterable residue as determined by analytical procedures set forth in the Manual of Methods for Chemical Analysis of Water and Wastes (USEPA Office of Technology Transfer, Washington D.C. March 1983).

TREATMENT TRAIN - a sequence of structures or devices through which runoff passes before exiting the project site. The combined characteristics of the individual structures or devices shall satisfy the performance requirements associated with the no net increase provisions of this ordinance.

URBAN REDEVELOPMENT AREA – previously developed areas or 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
4. Designated as Urban Coordinating Council Empowerment Neighborhoods.

ARTICLE III
Proposed Stormwater Management Standards

§330-7. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

This section 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 Section 4, either:

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

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

2. This groundwater recharge requirement does not apply to projects within an “urban redevelopment area” or to projects to which the following 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 that "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with NJDEP 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 processing, manufacturing or other industrial activities, which could be a source of pollutants in an 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 processing, manufacturing, or other industrial activities that are exposed to stormwater.

3. The design engineer shall assess the hydraulic impact on the groundwater table and design the site as to avoid adverse hydraulic impacts. Adverse 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 calculations in Section 4**,** complete one of the following:

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

2. Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre construction condition, in the peak runoff rates of stormwater leaving the site for the 2, 10, and 100 year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at the site or anywhere downstream. This analysis shall include the analysis of impact of existing land uses and projected land uses assuming full development under existing zoning or land use ordinances in the drainage area;

3. Design stormwater management measures so that the post construction peak runoff for the 2, 10,100 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. The percentages only apply to the post construction stormwater runoff that is attributed to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post construction 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 area, stormwater runoff quantity analysis in accordance with (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,

5. Any applicant for a new agricultural development that meets the definition of major development in Section 2 shall be submitted to Somerset-Union County Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Somerset-Union County 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 the sale or boarding of livestock. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

§330-8. Stormwater Runoff Quality Standards

Multiple structures or devices may satisfy water quality control and infiltration performance requirements of this ordinance, in most circumstances. Furthermore, most structures or devices will attain both water quality and infiltration requirements. Compliance with the provisions of this ordinance will be based on a project wide summation of runoff characteristics. The applicant shall show how the structures or devices incorporated into the project will satisfy the performance requirements of this ordinance.

A. Stormwater management measures shall be designed to reduce the post construction load of total suspended solids in stormwater runoff by 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 ¼ 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 for this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of the 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	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

B. For purposes of TSS reduction calculations, Table 2 presents the presumed removal rates for certain BMP's designed in accordance with the New Jersey Stormwater Best Management Practices Manual. TSS reduction shall be calculated based on the removal rates for the BMP's in Table 2. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of an 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.

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

$$R = A+B-(AxB)/100$$

Where

R = total TSS percent load removal from application of both BMP's, 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 BMP's	
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 Section 7.6
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

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

E. 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 non-structural measures and structural measures that optimize nutrient removal while still achieving the performances in 3.1 and 3.2.

F. In accordance with the definition of FW1 at N.J.A.C. 7:9B-14, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

G. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and the perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps, County Soil Surveys, or as referenced in the Franklin Township Stream Corridor Protection Ordinance 112-30**,** within the associated HUC 14 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:

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

   a. A 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 of from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural successions is provided.

   b. Encroachment within the designated special water resource protection area under subsection (a) above shall only be allowed where previous development or disturbance has occurred (i.e. agricultural use, lawn area inlet, or parking area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of the bank of the waterway or from the centerline of the waterway where the bank is not defined. All encroachments under this subparagraph shall be subject to review and approval by the Department.

2. 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.*

3. If stormwater discharged outside of and flow 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 are, provided that:

   a. Stabilization measures shall not be placed within 150 feet of the Category One streamway;
   b. Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;
   c. Temperature shall be addressed to ensure no impact in the receiving waterway;
   d. The encroachment shall only be allowed where the applicant demonstrated that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
   e. A conceptual project design meeting shall be held with the appropriate NJDEP staff and The Somerset-Union County Soil Conservation District staff to identify necessary stabilization measures; and
   f. All encroachments proposed under this section shall be subject to review and approval by all appropriate NJDEP Departments.

4. 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 the Franklin Township Municipal Stormwater Management Plan. If a stream corridor protection plan for a waterway subject to Section 3.2 (G) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special waterways resource protection area requirements for that waterway. A stream corridor for a waterway subject to Section 3.2 (G) shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in Section 3.2 (G) (1) (a) above. In no case shall a stream corridor protection plan allow reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.

5. Paragraph 3.2-G. does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

§330-9. Technical Standards

A. 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 season high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).

B. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet

structure shall be spaced no greater than one-third the width of the diameter of the orifice or one-third the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. The trash racks shall also comply with the safety standards of this ordinance in Section 11.

C. 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 R.S.I.S. at N.J.A.C. 5;21-7.3,7.4,and 7.5 shall be deemed to meet this requirement.

D. All materials used in the construction of storm sewers, bridges and other drainage structures shall be in accordance with current specifications of NJDOT for Road and Bridge Construction, as prepared by the New Jersey Department of Transportation, and any supplements, addenda and modifications thereto unless otherwise specified by the reviewing municipal agency. Modifications or changes of these specifications may be requested by the applicant but may be implemented only with the knowledge and written consent of the Township Engineer after discussion with the reviewing municipal agency.

E. Pipe sizes shall be determined by acceptable drainage design procedures; provided that the pipe size in a surface water drainage system shall be no less than fifteen inches (15") in diameter. Design Engineers may use a 12- inch diameter pipe as a cross-drain to a single inlet.

F. Drainage inlets shall be located at all intersections, with inlets on both sides of a street at intervals of not more than four hundred feet (400') or such shorter distances as required to prevent the flow of surface water from exceeding six (6) cubic feet per second at the drainage inlet. Access manholes shall be placed at maximum four hundred foot (400') intervals throughout the system and at pipe junctions where there are no drainage inlets.

G. Surface water in all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic, and will not create ponding in paved areas. Area inlets in parking lots should be limited to 3 cubic feet per second. Gutters or paved swales shall be used whenever, in the judgment of the Township Engineer, they are necessary to avoid erosion.

H. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 feet (IRC 2000, NJ Edition, Section R401.3). Unless the relief is granted by reviewing agency, lawn areas shall be graded at a minimum two percent (2%) grade in order to secure proper drainage. Additionally, drainage shall be provided in a manner, which will prevent the collection of storm water in pools, or other unauthorized concentrations of flow and water shall not flow across adjacent property lines at greater than pre-development rates.

I. Design flows and capacities for storm water management.

1. Collection and detention/retention for range of storms as follows: 2 year, 10 year, 25 year, 50 year, and 100 year with current water quality standards under state and federal regulations.

2. Bridges and culverts shall be designed for 100-year storm minimum flow capacities.

J. Detention or retention basins will be required to hold storm water runoff such that discharge from the site will not exceed pre-development rates or good meadow condition whichever is less. A waiver of this provision may be granted only when the applicant proves to the reviewing agency that the effects of additional runoff resulting from the proposed development will be negligible. When detention or retention basins are required, the outlet from the detention facility must conform with current state and federal requirements for water quality and be less than ninety percent (90%) of the runoff from 1 1/4 inches of rainfall, falling in two (2) hours. Stormwater must be retained so that not over ninety percent (90%) will be evacuated prior to thirty-six (36) hours. The following exceptions to this provision will be acceptable in any case:

1. Retention will not be required to an extent, which would reduce the outlet size to a diameter less than two and one half inches (2.5");

2. Dry basins serving residential projects may allow evacuation of ninety percent (90%) in eighteen (18) hours;

K. In cases where runoff is from single family housing and unimproved areas only, and where the runoff enters detention basins after moving by sheet flow over at least thirty feet (30') of lawn or leaf mulch areas, outlets shall be designed so that retention storage, when full, will be ninety percent (90%) evacuated over twelve (12) hours.

L. Approval of drainage structures shall be obtained from the appropriate municipal, county, state and federal agencies and office. Where required, each applicant shall make application to NJDEP, the Somerset County Engineering Department and the Township Engineer. Final approval shall not be effective until letters of approval from the proper governmental authorities shall be furnished to the Secretary of the Planning Board or the Secretary of the Zoning Board of Adjustment, as the case may be, with a copy of each letter forwarded to the Township Engineer.

M. Applicants shall meet all provisions of the Franklin Township Stream Corridor Preservation Ordinance 112-30 *et seq*. All new lots in major and minor subdivisions and all building location in site plans shall be designed to provide sufficient areas outside of Stream Corridor Preservation Areas and within required setbacks to accommodate a structure for which it is being created as well as any normal accessory uses appurtenant thereto which would require disturbance. Any development or use requiring approval under Section 112-30E of this ordinance shall require either site plan review or subdivision review pursuant to sections 112-10 *et. seq.* and 112-15 *et. seq*. shall be applicable and shall be in addition to the requirements for submission listed in Section 112-30G. Nothing in this section shall relieve an applicant from complying with other requirements that are applicable to the development. An approved application for development or use on a lot which contains a stream corridor or portion of a stream corridor shall provide a conservation easement delineated by metes and bounds for the continued protection of the stream corridor. Conservation easements shall be established by deed if no subdivision map is being filed, or by plat filed with the County Recording Officer in compliance with the Map Filing Law. All easements shall be delineated by monuments. Appropriate monuments shall be set by a licensed land surveyor.

N. Surface drainage of each lot will be reviewed to assure that stormwater flows will not cascade from one lot to another in a manner that would be detrimental to the use of an adjoining lot. This may require surface water controls such as swales, surface drainage inlets and appropriate easements.

ARTICLE IV
Calculation of Stormwater Runoff and Groundwater Recharge

§330-10. Stormwater Runoff Calculations

A. The design engineer shall calculate runoff using one of the following methods:

1. The USDA Natural Resources Conservation Service (formerly known as US Soil Conservation Service) methodology. This methodology is particularly useful for comparing pre- and post- development peak rates, volumes and hydrographs. The key component of the NRCS runoff equation is the NRCS Curve Number (CN), which is based on soil permeability, surface cover, hydrologic condition and antecedent moisture. Watershed or drainage area time of concentration is the key component of the dimensionless unit hydrograph. Several runoff computation methods use the overall NRCS methodology. The most common are:

a. June 1986 Technical Release No. 55 - Urban Hydrology for Small Watersheds (TR-55);
b. April 2002 WINTR-55 Small Watershed Hydrology computer program ;
c. Technical Release 20- Computer Program for Project Formulation; Hydrology (R-20) published by the NRCS;
d. Hec-1 Flood Hydrograph Package published by the US Army Corps of Engineers' hydrologic Engineering Center; and
e. HEC-MS Hydrologic Modeling System published by the US Army Corps of Engineers' hydrologic Engineering Center.

2. The Rational Method for peak flow and the modified Rational Method for hydrograph computations.

B. In computing pre-project construction runoff, all significant land features, such as ponds, depressions, or hedgerows, which increase the ponding factors, shall be accounted for;

C. 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.

§330-11. Groundwater Recharge Calculations

A. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Groundwater Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information can be found in the New Jersey Best Management Practices Manual; at http://www.state.nj.us/dep/njgs/.

§330-12. Design Storms

A. To fully comply with the NJDEP stormwater Management Rules, stormwater runoff must be computed for three types of rainfall or storm events. These storms are associated with the groundwater recharge, stormwater quality and stormwater quantity requirement in the rules.

1. Ground Water Recharge Design Storm- Groundwater recharge requirements are met through the analysis of a series of rainfall events derived from long-term New Jersey data. These events can also be expressed by an equivalent groundwater recharge design storm that represents the largest rainfall that must be controlled by a groundwater recharge facility. Proposed major land development are required to comply with one of the two following groundwater recharge requirements:

a. the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
b. that the increase of stormwater runoff volume from the pre-construction to post-construction for the 2-year storm is infiltrated.

2. Stormwater Quality Design Storm- This is the rainfall event used to analyze and design structural and nonstructural stormwater quality measures. As described in the Stormwater Management rules, the NJDEP stormwater quality design storm has a total rainfall depth of 1.25 inches and a total duration of 2 hours; and

3. Stormwater Quantity Design Storm- As described in the Stormwater Management Rules, the three storm frequencies of primary concern for stormwater quantity control are 2, 10, and 100-year events.

ARTICLE V
Requirements for Selected Stormwater Management Measures

Considerations will be given to other innovative BMP's not listed in this ordinance, however, the applicant will be required, when proposing the use of alternative BMP's to provide the Planning Board or Board of Adjustment with detailed engineering plans and performance capabilities that the design will accomplish the required water quantity, groundwater recharge and water quality established by this ordinance. Any vegetation used in the creation of BMP's shall be non-invasive, non-exotic species.

§330-13. Detention/Retention Basins for Stream Flooding and Erosion Control

A. The standards for detention/retention basins shall be as follows:

1. Detention and /or retention basins shall be designed to capture and retain all stormwater runoff from the site's impervious surfaces during the water quality storms, and from all smaller storms. The runoff shall then be slowly released in accordance with the requirements presented in Section 3.9. For detention basins with the use of other BMP's such as drywells, infiltration systems, grassed swales, etc., used in concert with detention and retention basins;

2. Most water quality control and infiltration measures will also provide some benefit in runoff peak control. Where water quality control or infiltration measures are instituted, appropriate adjustments to the post-development peak runoff may be incorporated by the introduction of modified runoff coefficients (e.g., time of concentration). Procedures used by the applicant to adjust runoff coefficients to take credit for the detention properties of miscellaneous stormwater control measures (i.e., measures not specifically designed for providing runoff peak control) must be approved by the Township professionals;

3. The applicant shall provide plans and calculations, which show that the discharge attributable to the proposed project will not cause erosion along the flow path between the outfall and the receiving water body;

4. Soil erosion and sediment control shall be provided in accordance with Standards for Soil Erosion and Sediment Control Act promulgated by the State Soil Conservation Committee pursuant to *N.J.S.A.* 4:24-39 *et seq.,* administered by the Soil Conservation Service, Somerset County District;

5. If detention basins or other detention facilities are provided through which water passes at times other than following rainfall, the Township professionals shall be consulted concerning design criteria. It will be necessary for detention requirements to be met, despite the necessity of passing certain low flows. This applies to all on-stream or on-line detention basins;

6. Detention basins located in freshwater wetlands may be allowed only in accordance with Freshwater Wetlands Protection Act, *N.J.S.A.* 13.9B-1 *et seq.*, and any rules adopted pursuant thereto; and

7. Any detention facility that impounds water through the use of any artificial dike, levee or other barrier and raises the water level five feet or more above the usual mean low water height when measured from the downstream toe-of-dam to the emergency spillway crest is classified as a dam and subject to the New Jersey dam safety standards, *N.J.A.C.* 7:20. All such dams must be designed, constructed, operated in accordance with State standards.

ARTICLE VI
Mitigation Measures

If the natural or existing physical characteristics of the project site preclude achievement of any of the performance standards of this ordinance, the municipality may grant a variance from strict compliance of the performance standards set forth in this ordinance, provided that acceptable mitigation measures are provided.

§330-14. Mitigation requirements

In order to grant a variance or exemption from the design and performance standards in N.J.A.C. 7:5, a mitigation plan that identifies what measures are necessary to offset the deficit created by granting the variance or exemption. The mitigation plan shall ensure that mitigation is completed within the drainage area and for the performance standard for which the variance or exemption was granted, N.J.A.C. 7:8-4.6. The applicant must demonstrate to the satisfaction of the Township professionals that the immediately downstream waterways will not be subject to:

A. Deterioration of existing culverts, bridges, dams and other structures;

B. Deterioration of their biological functions, as well as for drainage and other purposes;

C. Streambank or streambed erosion or siltation; and

D. Increased threat of flood damage to public health, life and property.

Furthermore, where partial compliance with a specific provisions of this ordinance is possible, the Township professionals will direct the applicant to satisfy a reduced performance criterion. Mitigation measures will be required to compensate for the unfulfilled component provision.

In all cases, however, those provisions that are not precluded by the site's physical characteristics shall be met. Mitigation measures may include, but are not limited to, the following:

1. The mitigation project shall be implemented in the same drainage area as the proposed development and provide additional protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan;

2. The developer must ensure the long term maintenance of the project as set forth in this ordinance;

3. The applicant can select one or more of the projects listed in the Municipal Stormwater Management Plan listed under Mitigation Plans and Mitigation Project Criteria; and

4. If a suitable site cannot be located in the same drainage area as the proposed development, the municipality may allow the applicant to either construct or provide funding for a Stormwater Mitigation Project. The projects are listed in the Municipal Stormwater Management Plan under Mitigation Plans and Mitigation Project Criteria. Included shall be the costs associated with purchasing the property or easement for mitigation and the costs associated with the long term maintenance requirements of the mitigation measure.

ARTICLE VII
Requirements for Selected Stormwater Management Measures

These measures include but are not limited to the following requirements:

§330-15. Extended Detention basins:

A detention basin is a facility constructed through filling and/or excavation that provide temporary storage of stormwater runoff. An extended detention basin is normally designed as multi stage facility that provides runoff storage and attenuation for both stormwater quality and quantity management.

A. Detention basins shall not be located within the floodway of any watercourse;

B The construction of detention basins in flood plains should be avoided, but where this is unavoidable, a special examination to determine adequacy of a proposed detention facility during extreme storm events shall be required. This examination is required to determine what effects, if any, the tailwaters created by the flood plain have on the outflow from and effective storage within the detention facility. All designs of basins in flood plains, therefore, should be based upon an accurate and thorough determination of

tailwater effects resulting from runoff from the site and the watershed contributing to the flood plain;

C. All extended detention basins shall achieve a 60 percent TSS removal rate, a minimum of 10 percent of this runoff volume must remain in the basin for 24 hours after the peak basin water surface and maximum runoff storage volume is achieved;

D. The minimum outlet diameter, width or height is 2.5 inches. If this minimum outlet size does not allow for the detention times required in this ordinance, then alternative techniques for the removal of TSS prior to discharge into the basin shall be provided;

E. The species of native, non-intrusive, non-exotic vegetation used in the basin shall be approved by Franklin Township and the Somerset – Union County Soil Conservation District; and when structural measures are proposed they shall comply with the requirement of the R.S.I.S. 5:21- 7.1 *et seq.*

F. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for detention basins.

§330-16. Wet Ponds

A. Such basins shall not be located within the floodway of any watercourse.

B. The basic design parameter for a wet pond is the ratio of its permanent pool volume to the volume of runoff entering the pool. This runoff is used to determine the pond's TSS removal rate;

C. The pool shall be shallow enough to avoid thermal stratification and deep enough to minimize algal bloom and resuspension of decomposing organics and other previously deposited materials;

D. An applicant, when proposing the use of a wet pond, shall submit data (e.g., average monthly flushing rates), which document that the wet pond will not be subject to excessive stagnation during periods of nominal inflow. If the wet pond will become stagnant, the applicant may be required to provide some form of aeration or circulation to eliminate such conditions and associated negative water quality and public health consequences;

E. The length to width ratio should be as large as possible to simulate conditions found in plug flow reaction kinetics. Under ideal plug flow conditions, a plug or pulse runoff enters a pond and is treated by chemical reactions as well as the physical processes of dispersion and settlement as the pulse travels the length of the wet pond. Therefore, the pond's length to width ratio should be at least 3:1 to maximize these treatment processes. In cases where it is impractical to construct wet ponds with these lengths, internal baffles or berms may be added within the pond to increase the travel length and residence time;

F. Where feasible, native fish stock shall be used to control mosquitoes;

G. There shall be no adverse effect to the receiving watercourse resulting from differences in temperature between the discharge and the waters in the receiving watercourse;

H. The riser structure should be equipped with a bottom drainpipe, sized to drain the permanent pool within 40 hours so that sediments may be removed mechanically when necessary. The drainpipe should be controlled by a lockable valve that is readily accessible from the top of the outlet structure;

I. All wet ponds must be able to safely convey system overflows to downstream drainage systems. The capacity of the overflow must be sufficient to provide safe, stable discharge of stormwater in the event of an overflow. Wet ponds that are classified as dams under the NJDEP Dam Safety Standards at N.J.A.C. 7:20 must also meet the overflow requirements of these Standards, including safe conveyance of the wet pond's spillway design storm.

J. The hydraulic design of the outlet structure, outlet pipe, and emergency spillway in a wet pond must consider any significant tail water effects of downstream waterways or facilities. This includes instances where the permanent pool level is below the flood hazard area design flood elevation of the receiving stream.

K. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for wet ponds.

§330-17. Constructed Stormwater Wetlands:

A. A least one-half of the perimeter of the water area shall be graded to form a shallow bench for emergent wetland plant species;

B. The surface area of the artificial wetlands shall be at least three percent of the total area contributing flow into the artificial wetland;

C. Monoculture planting should be avoided due to increase risk of loss from pests and disease. When possible, field collected plants should be used in lieu of nursery plants. Plants collected from the field have already adapted and are acclimated to the region. If nursery plants are used, they should be obtained locally, or from an area with similar climatic conditions as the eco-region of the artificial wetland;

D. At least two hardy and rapid colonizing indigenous primary wetlands species shall be planted. Alternating plant species with varying root depths have a greater opportunity of pollutant removal. Up to three less aggressively colonizing secondary wetlands species shall be randomly distributed in clumps around the perimeter of the marsh;

E. At least 25 percent of the total surface area of a basin designed exclusively to act as a shallow marsh shall be open water with a depth of at least two feet in order to provide habitat for waterfowl and other marsh birds.

F. Artificial wetlands should not be located within natural wetlands areas since they will not typically have the same full range of ecological functions.

G. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for artificial wetlands.

H. The applicant must have a maintenance plan and if privately owned, be protected by easement, deed restriction, ordinance, or other legal measures to prevent its neglect, adverse alteration, and removal.

§330-18. Infiltration facilities

A. Surface and subsurface infiltration facilities:

An infiltration basin is a facility constructed within highly permeable soils that provide temporary storage of stormwater runoff. An infiltration basin does not normally have a structural outlet to discharge runoff from the stormwater quality design storm.

1. An infiltration basin must be designed to treat the total runoff volume generated by the basin's maximum design storm. This may be either the groundwater recharge or stormwater quality design storm, depending upon the basins use;

2. Precautions shall be taken to prevent both subgrade soil compaction and sediment contamination;

3. An infiltration basin must also fully drain this runoff volume within 72 hours. Runoff storage for greater times can render the basin ineffective and may result in anaerobic conditions, odor, and both water quality and mosquito breeding conditions. The bottom of the infiltration must be at least 2 feet above the seasonal high water table or bedrock. The maximum depth of impoundment shall be two feet;

4. A 6-inch layer of sand must be placed on the bottom of an infiltration basin. This sand layer can intercept silt, sediment, and debris that could otherwise clog the top layer of the soil below the basin. The sand layer must meet the specifications of a K5 soil as certified by a professional engineer;

5. The design of the infiltration facility shall be based on infiltration rates measured using procedures outlined the design standards presented in the NJDEP Best Management Practices Manual dated April 2004;

6. A subsurface infiltration basin is located entirely below the ground surface. It may consist of a vault, perforated pipe, and/or stone bed. However, due to greater difficulty removing silt, sediment, and debris, all runoff to subsurface infiltration basis must be pretreated. This pretreatment must remove 80 percent of the TSS in the runoff from the basin's maximum design storm; and

7. The applicant must have a maintenance plan and if privately owned, be protected by easement, deed restriction, ordinance, or other legal measures to prevent its neglect, adverse alteration, and removal.

§330-19. Pervious Paving Systems

A. Pervious paving systems are paved areas that produce less stormwater runoff than areas paved with conventional paving. The reduction is achieved primarily through the infiltration of a greater portion of the rain falling on the area than would occur with conventional paving. Pervious paving systems are divided into three general types:

1. Porous paving – Porous asphalt or concrete paving constructed over a runoff storage bed of uniformly graded broken stone. Adopted TSS removal rate 80%.

2. Permeable pavers with storage bed – Impervious concrete pavers with surface voids constructed over a runoff storage bed of uniformly graded broken stone. Adopted TSS removal rate 80%.

3. Permeable pavers without storage bed – Impervious concrete pavers with surface voids constructed over structural bed of sand and crushed stone. This system is for volume reduction only.

B. The applicant shall undertake a strict maintenance schedule including, but not limited to, vacuum sweeping at least four times a year. A high pressure hosing should follow this. All dislodged sediment and other particulate matter must be removed and properly disposed;

C. Due to the reduced shear strength of the surface course, all pervious paving systems are limited to areas of relatively infrequent use by light vehicles. This includes parking lot spaces and secondary aisles, single-family residential driveways, sidewalks and walkways, golf cart paths, and overflow parking areas. The areas shall be marked by a sign restricting traffic to only passenger vehicles;

D. Sand, grit or cinders should not be used on pervious paving courses for snow or ice removal;

E. All porous paving and permeable pavers with storage bed systems must be able to safely convey system overflows to downstream drainage systems. The capacity of the overflow must be consistent with the remainder of the site's drainage system and sufficient to provide safe, stable discharge of stormwater in the event of an overflow. The downstream drainage system must have sufficient capacity to convey the overflow from the pervious paving system; and

F. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for pervious pavement.

§330-20. Manufactured Treatment Devices

A manufactured treatment device is a pre-fabricated stormwater treatment structure utilizing settling, filtration, absorptive/adsorptive materials, vortex separation, vegetative components, and/or other appropriate technology to remove pollutants from stormwater runoff.

A. A manufactured treatment device is adequate for small drainage areas that contain a predominance of impervious cover that is likely to contribute high hydrocarbons and sediment loadings. For larger sites multiple devices may be necessary;

B. The applicant shall submit design calculations and performance curves for all devices;

C. Devices should be used for pre-treatment, not post treatment;

D. Manufactured treatment devices shall be used to treat mostly impervious surfaces. No large tracts of pervious surfaces should be routed into the device;

E. All manufactured treatment devices must be able to safely overflow or bypass flows in excess of the stormwater quality design storm to downstream drainage systems. The capacity of the overflow or bypass must be consistence with the remainder of the site's drainage system. All such flows must be conveyed in such a manner that trapped material, including floatables, is not resuspended and released. The designer must also check the capacity of the downstream conveyance system to ensure the adequacy of the overflow or bypass. All manufactured treatment devices must also have similar provisions;

H. The hydraulic design of all manufactured treatment devices must consider any significant tail water effects of downstream waterways or facilities. This includes instances where the lowest invert in the outlet or overflow structure is below the flood hazard design flood elevation of the receiving stream;

I. The NJDEP Division of Science, Research & Technology (DSRT) is responsible for certifying pollutant removal rates for all manufactured treatment devices. The final certification process must be based upon one of the following:

1. Verification of the device's pollutant removal rates by the N.J. Corporation for Advanced Technology (NJCAT) in accordance with the New Jersey Energy and Environmental Technology Verification Program at N.J. S.A. 13:D-134 *et seq.* This verification must be conducted in accordance with the protocol "Stormwater Best Management Practices Demonstration Tier II Protocol for Interstate Reciprocity" as developed under the Environmental Council of States (ECOS) and Technology Acceptance and Reciprocity Partnership (TARP);

2. Verification of the device's pollution removal rates by another TARP state, or another state or government agency that is recognized by New Jersey through a formal reciprocity agreement, provided that such verification is conducted in accordance with the protocol "Stormwater Best Management Practices Demonstration Tier II Protocol for Interstate Reciprocity";

3. Verification of the device's pollutant removal rates by other third party testing organizations (i.e., NSF), provided that such verification is conducted in accordance with the protocol "Stormwater Best Management Practices Demonstration Tier II Protocol for Interstate Reciprocity";

J. All manufactured treatment devices must be able to safely overflow or bypass flows in excess of the stormwater quality design storm to downstream drainage systems; and

K. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for manufactured treatment devices.

§330-21. Drywells

Subsurface facilities that receive and temporarily store stormwater runoff from roofs of surrounding structures. Drywells are used to reduce the increased volume of stormwater due to building construction. A drywell cannot be used directly to comply with the suspended solids and nutrient removal requirements contained in the NJDEP Stormwater Management Rules 7:8.

A. Design parameters for a drywell are its storage volume and permeability rate of subsoil;

B. Drywells shall be designed to treat the total runoff volume generated by the drywell's maximum design storm. This may be either the groundwater recharge or stormwater quality design storm, depending on proposed use;

C. Must fully drain runoff volume within 72 hour;

D. Bottom of drywell shall be 2 feet above seasonal high water table or bedrock and be as level as possible to uniformly disperse runoff infiltration over subgrade soils;

E. Subgrade soils shall not be compacted; and

F. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for drywells.

§330-22. Sand filters

Consist of a forebay and underdrained soil bed. It can be either a surface or a subsurface facility. Sand filters use solids, settling, filtering and adsorption process to reduce pollutant concentration in stormwaters. The adopted TSS removal rate for this measure is 80 percent.

A. Sand filters usually consist of:

1. forbay zone;
2. sand bed zone;
3. sand bed underdrain; and
4. overflow.

B. Basic design parameters are surface areas, the temporary storage volumes in their forebays and sand bed zones and the thickness infiltration rate of the sand beds;

C. Thickness of the sand bed shall provide adequate pollutant removal, while the bed's permeability or infiltration rate must be sufficient to drain the stored runoff within 72 hours;

D. Gravel layer serves as bedding material for underdrain pipes. It shall have sufficient thickness to provide a minimum of 2 inches of gravel above and below the pipes;

E. Gravel layer shall consist of .5" – 1.5" clean broken stone or pea gravel;

F. Underdrain piping shall be rigid schedule 40 PVC. Perforated pipe shall have a minimum of 3/8" diameter perforations at 6 inch on center with 4 perforations per annular row;

G. Clean outs shall be located at the upstream and downstream storm ends of the perforated section of the underdrain and extend to or above the surface of the sand bed;

H. Underdrain piping shall be connected to a downstream storm sewer, manhole, catch basin, channel, swale, or ground surface at a location that is not subject to blockage; and

I. The hydraulic design of the underdrain and overflow systems, as well as any stormwater quantity control outlets, must consider any significant tailwater effects of downstream waterways or facilities. This includes instances where the lowest invert in the outlet or overflow structure is below the flood hazard area design flood elevation of a receiving stream.

J. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for sand filter systems.

§330-23. Vegetative Filters

Area designed to remove suspended solids and other pollutants from stormwater runoff flowing through a length of vegetation called a vegetated filter strip.

A. All runoff to a vegetative filter strip must enter and flow through the strip as sheet flow;

B. TSS removal rate depends on the vegetated cover of the filter strip. Refer to NJ Stormwater Management Best Practices Manual dated April 2004 Table 9.10-1 for removal rates;

C. Prior design parameters for a vegetative filter strip are its slope, type of vegetative cover and type of soils in drainage area;

D. Vegetation in a filter strip can range from turf and native grasses to herbaceous and woody vegetation, all of which can either be planted or indigenous;

E. All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health must not compromise the intended purpose of the vegetative filter; and

F. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for Vegetative filter systems

§330-24. Bioretention Systems

Consists of a soil bed planted with native vegetation located above an underdrained sand layer. It can be configured as a bioretention basin or swale. Stormwater runoff entering the bioretention system is filtered first through the vegetation and then the sand/soil mixture before being conveyed downstream by the underdrain system. The adopted TSS remove rate is 90 percent.

A. Runoff inflow shall be overland flow to prevent disturbance to the vegetation and soil bed;

B. Concentrated inflow from a drainage pipe or swale must include adequate erosion protection and energy dissipation measures;

C. The Seasonal High Water Table shall be evaluated to ensure that the Seasonal High Water Table is at least 1 foot below the bottom of the bioretention basin's underdrain system during non-drought conditions;

D. Basic design parameters are the system's storage volume, the thickness, character and permeability rate of its planting soil bed, and the hydraulic capacity of its underdrain;

E. The beds permeability rate must be sufficient to drain the stored runoff within 72 hours;

F. Bioretention systems shall be designed to treat the runoff volume generated by the stormwater quality design storm;

G. Maximum water depth during treatment of the stormwater quality design storm shall be 12 inches in a basin and 18 inches in a swale;

H. Minimum diameter of any outlet or overflow orifice is 2.5 inches;

I. Permeability rate shall be determined by field or laboratory testing;

J. Total depth or thickness of the planting soil bed shall be a minimum of 3 feet. Planting soil bed shall consist of:

1. 10 – 15 percent clays;
2. minimum 65 percent sands; and
3. balance to be silts.

K. Gravel layer serves as bedding material for underdrain pipes. It shall have sufficient thickness to provide a minimum of 2 inches of gravel above and below the pipes;

L. Gravel layer shall consist of .5" – 1.5" clean broken stone or pea gravel;

M. Underdrain piping shall be rigid schedule 40 PVC laid at a minimum slope of 0.50 percent;

N. Clean outs shall be located at the upstream and downstream storm ends of the perforated section of the underdrain and extend to or above the surface of the planting soil bed;

O. The hydraulic design of the underdrain and overflow systems, as well as any stormwater quantity control outlets, must consider any significant tailwater effects of downstream waterways or facilities. This includes instances where the lowest invert in the outlet or overflow structure is below the flood hazard area design flood elevation of a receiving stream;

P. All bioretention systems must be able to safely convey system overflows to downstream drainage systems. The capacity of the overflow must be sufficient to provide safe, stable discharge of stormwater in the event of an overflow. Bioretention systems that are classified as dams under the NJDEP Dam Safety Standards at N.J.A.C. 7:20 must also meet the overflow requirements of these Standards;

Q. The applicant must have a maintenance plan and, if privately owned, be protected by easement, deed restriction, ordinance, or other legal measures to prevent its neglect, adverse alteration, and removal; and

R. Refer to the design standards presented in the NJDEP Best Management Practices Manual dated April 2004 for Bioretention Systems.

ARTICLE VIII
Retrofit of Existing Stormwater Management Measures

A. Retrofitting can be defined as expanding, modifying, or otherwise upgrading an existing stormwater management measure. As such, retrofitting stormwater management measures can reduce some of the adverse groundwater recharge and stormwater quality and quantity impacts caused by existing land developments. Many existing stormwater management measures can be dramatically improved and downstream water bodies protected through effective retrofitting;

B. Effective retrofitting of existing stormwater management facilities can correct site nuisances, maintenance problems, and aesthetic concerns;

C. A retrofit must not increase health and safety risks in anyway;

D. In many retrofit situations, it may not be possible to upgrade the stormwater management measure to meet all current groundwater recharge and stormwater quality and quantity standards. Performance improvements for a range of retrofits must evaluated to determine which one represents the optimum combination of effectiveness, viability, and cost. As a result, the final retrofit selected for an existing stormwater measure will have to be based on its relative rather than absolute effectiveness. In such relative determinations, both the costs and benefits of the evaluated retrofits become more influential factors then when an absolute performance standard is used;

E. Retrofitting of an existing stormwater facility can change the pollutant removal of the system. Other chemical or biological compositions of the sediment can change causing potentially hazardous or toxic sediment. Finally, the retrofit may increase the number and/or complexity of components in an existing stormwater management measure. Thus, increased staffing, improved equipment, and more specialized training may be required to properly maintain the new retrofitted system. The impacts of any increased inspections and /or maintenance requirements should be determined and thoroughly evaluated; and

F. In addition to structural measures, non-structural stormwater management measures can be used to enhance the stormwater management of an existing development site.

ARTICLE IX
Requirements for a Site Development Stormwater Plan

A. Whenever an applicant seeks municipal approval of a development subject to this ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan, as part of the submission of the application for subdivision of site plan approval.

B. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.

C. The submission requirements set forth in the checklist in are in addition to any other required development checklists. Failure to provide all items will result in an application being deemed incomplete.

§330-25. Site Development Stormwater Plan Approval

The applicant's plans for development shall be reviewed as a part of the subdivision or site plan review process by the approving authority. The approving authority may consult its professionals (as appropriate) to determine if all the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this ordinance.

§330-26. Checklist Requirements

The following information shall be required:

1. Topographic Base Map - A topographic base map of the site shall be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of 1"=200' or greater, showing 2-foot contour intervals. The map shall indicate existing surface water drainage; marshlands and other wetlands; pervious or vegetative surfaces; existing man-made structures; roads; bearing and distances of property lines; and significant natural and manmade features not otherwise shown. The reviewing professionals may require upstream tributary drainage system information as necessary.

2. Environmental Site Analysis - A written and graphic description of the natural and man-made features of the site and its environs shall be provided. This description should include a discussion of soil conditions, slopes, wetlands, 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 an 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 this ordinance 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 problems and source controls wherever possible.

5. Stormwater Management Facilities Map - The following information shall be provided and 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, estimated 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 surface water.

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 pre-development and post-development conditions for the design storms as specified in Section 3 of this ordinance. Post-development pollution load should be computed using the any of the pollutant models as detailed in the most recent NJDEP BMP Manual.

b. When the proposed stormwater management control measures (e.g., infiltration basins) depend on the hydrologic properties of soils, then a soils report shall be submitted. This 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 soil types present at the location of the control measure.

7. Waiver of Submission from Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation of the municipal engineer, waive submission of any of the requirements in Sections 10.C.1 through 10.C.6 of this ordinance when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

ARTICLE X
Planning and Design Standards for Maintenance and Repair

§330-27. Planning and Design Standards for Maintenance and Repair

A. The goal for the planning and design of a stormwater management facility is for its operation with the least practical amount of maintenance. To accomplish this, the facility shall be developed to eliminate avoidable maintenance tasks, minimize the long term amount of regular maintenance, facilitate the performance of required maintenance tasks, and reduce the potential for extensive, difficult, and costly remedial or emergency maintenance efforts.

B. Strong, durable, non corrodible materials, components, and fasteners shall be used to reduce required maintenance efforts. These include but are not limited to: lightweight non corrodible metals such as aluminum for trash racks, orifice plates, and access hatches; hardy, disease resistant grasses for bottoms and side slopes as prescribed by Soil Erosion and Sediment Control standards administered by the Somerset - Union Soil Conservation District; reinforced concrete for outlet structures and headwalls; and gabions for channel and outlet linings.

C. Detention facilities shall be designed to minimize propagation of insects, particularly mosquitoes.

D. Detention facilities should be designed in a harmonious and attractive manner.

E. Detention facility outlets shall be designed to function without manual, electric or mechanical controls.

F. All stormwater management measures' components must be readily accessible for inspection and maintenance. Therefore, trees, shrubs, and underbrush must be trimmed or

pruned as necessary to maintain access to the stormwater management measure via roadways, paths and ramps. This includes paths through perimeter vegetation to permanent pools, aquatic benches, and safety ledges to allow for the inspection and control of mosquito breeding. In addition, the exact limits of inspection and maintenance easements and right-of-way should be specified on stormwater management measure plans and included in the maintenance plan.

G. Maintenance shall be required as part of all stormwater management plans. Specific maintenance techniques and schedules shall be provided for each type of system used on the site. If maintenance of the system will be the responsibility of a person other than a State, County or Municipal agency, then the maintenance plan approved by the municipality shall be recorded upon the deed of record for the property.

1. The maintenance plan shall include the name, address and telephone number of the party or parties responsible for long-term maintenance. Documentation of their assumption of this responsibility shall be submitted as part of the permit application. The transfer of maintenance responsibility to individual property owners in residential subdivisions is prohibited except through a homeowner's association agreement.

2. Written maintenance and repair records for all stormwater management systems shall be maintained for at least five years by the persons identified in 1 above and shall be provided to the municipality annually.

3. Maintenance of artificial wetlands shall include, but not be limited to:

a. documented visual inspection of all components of the system at least four times annually;

b. documented removal of silt, litter and other debris from all catch basins, inlets and drainage pipes at least four times annually, as well as after every storm exceeding 1 inch of rainfall or upon noticeable buildup;

i. Vegetated areas should also be inspected at least annually for erosion and scour. And again annually for unwanted growth, which should be removed with minimum disruption to the remaining vegetation; and

ii. All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health should not compromise the intended purpose of the artificial wetland All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible;

c. Maintenance of detention basins shall include, but not be limited to:

i. documented visual inspection of all components of the systematic least four times annually;

ii. documented removal of silt, litter and other debris from all catch basins, inlets and drainage pipes at least four times annually, as well as after every storm exceeding 1 inch of rainfall or upon noticeable buildup;

iii. documented maintenance, including grass cutting, and necessary replacement of all landscape vegetation within the basin at least once a year, and

iv. documented aeration of basin bottoms at least once a year and scraping and replanting at least once every five years to prevent the sealing of the basin bottom.

d. Maintenance of wet ponds/retention basins shall include, but not be limited to, annual documented monitoring of water quality, dissolved oxygen, vegetative growth, temperature and fish population, for a period of three years to ensure that the wet pond/retention basin is working as intended;

H. Stormwater management facility components, such as valves, sluice gates, pumps, fence gates, locks, and access hatches, should remain functional at all times. Additionally, all mechanical components should be operated at least once every three months to assure their continued performance; and

I. Structural damage to outlet and inlet structures, trash racks, and headwalls from vandalism, flood events, or other causes must be repaired promptly. Equipment, materials and personnel must be available to perform these repairs on short notice. Qualified personnel should only undertake the analysis of structural damage and the design and performance of structural repairs;

ARTICLE XI
Safety Standards for Stormwater Management Basins

§330-28. Safety Standards for Stormwater Management Basins

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

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

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

   a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars;
   b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure;
   c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack;
   d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300lbs./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 inches across the smallest dimension;
   c. The overflow grate shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 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 pursuant to N.J.A.C. 7:8-6.3(a), 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 feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. Refer to R.S.I.S section 7:8-6.3 for illustration of safety ledges in a stormwater management basin; and

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.

4. Safety ledges shall be constructed on the slopes of all Constructed Stormwater Wetlands with a permanent pool of water deeper than 3 feet. Two ledges shall be constructed, each 4 to 6 feet in width. The first or upper ledge shall be located between 1 and 1.5 feet above the normal standing water level. The second or lower ledge shall be located approximately 2.5 feet below the normal standing water level.

ARTICLE XII
Inspection and Subsequent Fines for Non-Compliance of Ordinance

§330-29. Inspection and Subsequent Fines for Non-Compliance of Ordinance

A. All Best Management Practice Facilities are to be maintained by property owner, homeowners association or Franklin Township. Where Franklin Township is named to be the party responsible to maintain the facility, a Developers Maintenance Contribution shall be made.

1. Calculations for maintenance contributions for traditional BMP'S shall be based on Franklin Township's Development Ordinance Schedule A worksheet.

2. Calculations for maintenance contributions for non-traditional (as determined by the Township Engineer) BMP'S shall require an Engineer's Cost Estimate for maintenance required over a 25-year period.

B. Record keeping, inspection and repair guidelines and non-compliance penalties.

1. Maintenance records shall be submitted to the Franklin Township Municipal Clerks office. The maintenance records for the period of January 1 through December 31 must be reported no later than January 31st of the following calendar year.
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2. Mechanically treated structures which utilize filters shall have on record and be provided to the Township the requirements of the replacement of the filters as per the manufacturer and the dates the filters have been replaced.

3. Inspections shall include and not be limited to;

a. Detention basin outflow structures, escape provisions as outlined in R.S.I.S 7:8-6.2, and all components;

b. Vegetation;

c. Trash racks and overflow grates;

d. Embankment erosion; and

e. Sediment removal and pond maintenance.

4. Minor repairs of facility shall be completed within 30 days of date of notice.

5. Repairs, which may adversely affect the public's health, safety and welfare, must be completed immediately upon notice.

6. Each act of violation, and every day upon which any violation shall occur or continues to occur, shall constitute a separate offense.

7. A person who has not complied with this ordinance and who, after notice, refuses to implement and maintain soil erosion control and stormwater runoff control measures and facilities in conformance with these regulations shall be subject to a fine of not more than $1000.00 or ninety days in jail, or both, plus the cost of prosecution.

C. 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.

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

SECTION II
Severability

If any part or provision of these regulations or application thereof to any person or circumstances is adjudged invalid by any court of competent jurisdiction, such judgment shall be confined in its operation to that part, provision, or application directly involved in the controversy in which such judgment shall have been rendered and shall not affect of impair the validity of the remainder of these regulations or the application thereof to other persons or circumstances, The governing body hereby declares that it would have enacted the remainder of these regulations even without an such part, provision, or application found to be unlawful or invalid.

SECTION III
Effective Date

This ordinance shall take effect immediately upon final passage and publication in accordance with law and upon approval by the Somerset County Planning Board pursuant to *N.J.S.A.* 40:55D-97. If no response is received from the Somerset County Planning Board within sixty (60) days of its receipt, the ordinance shall then be considered to be in effect, as provided by the statute cited above.

ORDINANCE NO. 3607
This is a true copy of an ordinance adopted by the Township Council Township of Franklin, Somerset County, New Jersey.

Introduced:	April 25, 2006
Public Hearing:	May 23, 2006
Adoption:	May 23, 2006
Notice of Adoption:	May 30, 2006
Effective Date:	June 12, 2006

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Ann Marie McCarthy, Township Clerk