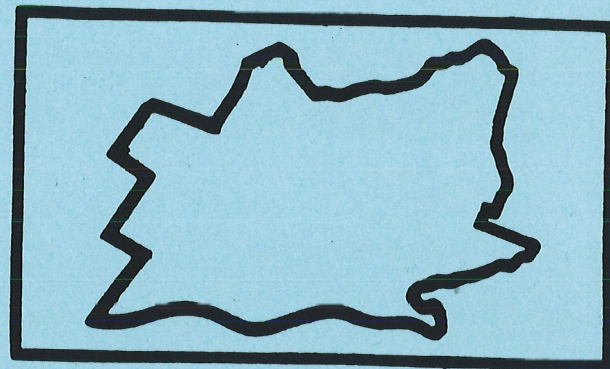


MERCER COUNTY,
NEW JERSEY

**Land
Development
Standards**



Storm Water
Management
Amendment

Approved as to Form and Legality

Date

B. J. Szafar
County Counsel

November 28, 1989

AMEND RESOLUTION NO. 98, ADOPTED FEBRUARY 10, 1970 WHICH ESTABLISHED "MERCER COUNTY LAND DEVELOPMENT STANDARDS" TO APPROVE "STORM WATER MANAGEMENT AMENDMENT" AND "SUBDIVISION/SITE PLAN ADMINISTRATIVE PROCEDURES"

WHEREAS, in accordance with the County Planning Enabling Act (R.S. 40:27-1 to 40:27-12 inclusive) the County Board of Chosen Freeholders did adopt on February 10, 1970 by Resolution No. 98, the Land Development Standards providing for the review of subdivisions and site plans by the County Planning Board; and,

WHEREAS, by Resolution No. 86-395, adopted August 12, 1986 Mercer County authorized execution of a contract between the New Jersey Department of Environmental Protection and Mercer County for preparation of a Phase I Storm Water Management Plan, as required by the New Jersey Storm Water Management Act, P.L. 1981, c.32; and,

WHEREAS, by Resolution No. 87-268, adopted June 10, 1989 Mercer County authorized execution of a contract with Fellows, Read & Associates, Inc. for the preparation of a Storm Water Management Plan for Mercer County; and,

Clerk to the Board

RECORD OF VOTE

FREEHOLDER	Aye	Nay	N.V.	Abs.	Res.	Sec.	FREEHOLDER	Aye	Nay	N.V.	Abs.	Res.	Sec.
Bronson	X					✓	Prunetti	X				✓	
Carabelli	X						Sollami	X					
Kramer	X						Inverso	X					
Palmer	X												

X—Indicates Vote Abs.—Absent N.V.—Not Voting
 Res.—Resolution Moved Sec.—Resolution Seconded

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WHEREAS, said Storm Water Management Plan is complete and constitutes "Storm Water Management Amendment" standards which are recommended by the Planning Board for adoption as part of the County Land Development Standards; and,

WHEREAS, the current subdivision and site plan submission requirements need greater clarification so as to provide the County Land Development Committee with pertinent information to facilitate its review of applications; and,

WHEREAS, there also exists a recurring problem with the current thirty (30) day review period for subdivision and site plan review; now, therefore,

BE IT RESOLVED, that:

Resolution No. 98, adopted February 10, 1970 entitled Mercer County, New Jersey Land Development Standards be and is hereby amended by the addition of the following, which are hereby made a part of this resolution:

- A. Report entitled "Land Development Standards-Storm Water Management Amendment"; and,
- B. Document entitled "Subdivision/Site Plan Administrative Procedures"; and,

BE IT FURTHER RESOLVED, that the Clerk of the Board be and is hereby directed to forward a copy of this resolution to the Mercer County Planning Board for administration of the Standards.

I hereby certify this to be a true
copy of the original.

Catherine J. ...
Mercer County Board of Freeholders

Clerk to the Board

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Storm Water Management Standards
prepared with the assistance of
Fellows, Read and Associates, Inc.

**The Land
Development
Standards of
the County of
Mercer, New Jersey
Storm Water
Management
Amendment**

Amendment adopted: November 28, 1989

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THE STORM WATER MANAGEMENT STANDARDS OF THE COUNTY OF MERCER

1. GENERAL REQUIREMENTS

A. Purpose of Review

Development contributes to increased flooding, increased channel erosion and increased quantities of pollutants. Regulation of increased storm water runoff from such development can control to some extent the adverse effects to the County's water resources. The County Engineer shall review each development for conformance to the design standards set forth herein to regulate the discharge of storm water runoff.

B. Applicability

The Storm Water Management Standards shall be applicable to any of the following types of development:

1. All site plans and subdivision plans subject to County Review and that add one acre or more of impervious surface (except as provided in Subparagraphs 3 and 5, below).

2. Any construction of one or more of the following uses:
 - a. Confined feeding and holding areas that have significant BOD producing potential as determined by SCS procedures;
 - b. Pipelines, storage, or distribution systems for petroleum products or chemicals;
 - c. Storage, distribution or treatment facilities (excluding onsite sewage disposal systems) for liquid waste;
 - d. Solid waste storage, disposition, incineration or landfill;
 - e. Quarries, mines or borrow pits;
 - f. Land application of sludge or effluents; and
 - g. Storage, distribution or treatment facilities for radioactive wastes.

3. In the event that control of storm water runoff is mandated in certain areas for construction covering less than one acre of ground, such lesser developments shall come under provisions of these standards.
4. In the case of projects for which Municipal and/or State approval of proposed drainage facilities is required, the applicant shall be required to comply with all provisions of the Municipal and/or State Standards. In such a case, the only provisions of the County Standards which shall govern are those requirements which are more strict than those of the Municipalities and/or State.
5. Any development adding impervious surface located within a watershed designated as "critical" by the County Engineer. There are no watersheds designated as "critical" at this time, however there may be watersheds within the county designated as "critical" in the future. A "critical" watershed is defined as a watershed, where chronic flood damages have occurred.

C. Submission Requirements

All information listed below is required for each proposed project.

1. Topographic Base Map

Topographic base map of the site extending a minimum of 200 feet beyond the limits of the proposed development at an appropriate scale to fit on one standard size sheet, showing one or two foot contour intervals. The base map shall also indicate existing surface water drainage, marshlands, woodlands, existing man-made structures, roads, utilities, property boundary with metes and bounds and significant natural and man-made features not otherwise shown. This map should include all the watershed boundaries and time of concentration path for predeveloped conditions. Natural ponding areas shall be shown.

2. Vicinity Map

Applicants must prepare a map at a scale of 1" = 400' or greater on a paper print of the latest air photographs available, updated in the field to reflect current

conditions, showing the relationship of the proposed development to significant features within one-half mile. The map must indicate at least the following: roads, pedestrian ways, access to the site, adjacent land uses, existing open space, public facilities, landmarks, places of architectural and historic significance, utilities, drainage (including, specifically, streams and other surface water shown on U.S.G.S. and soils map), and other significant features not otherwise shown.

3. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, 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.

4. Storm Water Management Map

A map at a scale of the topographical base map indicating the location of proposed buildings, roads, parking areas, utilities, structural facilities for detaining or recharging

storm water and sediment control, and other permanent structures. The map shall also clearly show areas where alterations in the natural terrain, cover, and grade are proposed, and changes in natural cover, including lawns and other landscaping. This map should also show all the watershed boundaries and time of concentration path. All natural and proposed ponding areas shall be shown.

5. Storm Water Management Report

The following information shall be included as a minimum:

- a. Project Description including total area to be paved or built upon, estimated land to be occupied by storm water management facilities and the type of vegetation thereon, and details of the plan to control and dispose of surface water.
- b. Computations of average curve runoff numbers which shall include soil types and existing and proposed land uses. Use Table 2-2a - Runoff Curve Numbers for Urban areas from SCS Technical Release 55.

c. Maximum discharge and total volume of runoff which would occur from the project area before and after development for the following storms:

1. One and a quarter inch of rainfall occurring within 2 hours, or 1 Year, 24 Hour SCS Type III Storm.

2. The specified design storms: 2 Year, 10 Year and 100 Year 24 Hour SCS Type III.

The source of any computerized programs should be clearly referenced by name, date of last update for easy reference.

d. Calculations for runoff after development shall include detention characteristics and hydrograph routings. Calculations for determination of the time of concentration shall be provided. The path of surface runoff used to determine the time of concentration should be shown on the topographic base map for predeveloped conditions and the storm water management map for post-developed conditions. Time of concentration and travel time calculations shall be completed in accordance with Chapter 3 of the SCS Technical Release 55. Calculations shall be made for offsite and uncontrolled drainage areas.

- e. Design and calculations of temporary sediment basins, rip-rap aprons, swales and other soil erosion and sediment control features shall be provided. Design and calculations shall be in conformance with the Standards for Soil Erosion and Sediment Control in New Jersey.

- f. Hydrologic and hydraulic calculations for the storm sewer collection system, culverts, and other storm water facilities.

- g. Hydrologic and hydraulic calculations for stream delineations, floodway and flood hazard limits in accordance with the NJDEP Stream Encroachment Manual.

2. DESIGN STANDARDS

A. General Standards

1. The project plans submitted shall demonstrate careful consideration of the general and specific concerns, values and standards of the County Master Plan and applicable municipal, regional and state storm drainage control programs including any County Mosquito Commission Control Standards and shall be based on environmentally sound site planning, engineering and architectural techniques.

B. Alternatives to Detention Basins

1. It is not necessary that stormwater management requirements be satisfied by means of detention basins. Rooftop storage, tanks, infiltration pits, dry wells, gravel layers underneath paving or other acceptable methods may be used for the purpose, with appropriate consideration for groundwater pollution, potential length of life and feasibility of continued maintenance. Certain types of infiltration practices are subject to the NJPDES-DGW (Discharge to Groundwater) Regulations.

2. Non-structural management practices, such as cluster land use development, open space acquisition, conservation of agricultural and critical constraint lands, stream encroachment and flood hazard controls should be coordinated with detention requirements.

3. WATER QUALITY CONTROL STANDARDS

A. Water Quality Control

All storm water management plans must provide for the control of a water quality design storm. The water quality design storm shall be defined as the 1 Year Frequency SCS Type III 24 Hour Storm or a 1 1/4 inch 2 Hour Rainfall.

The water quality design storm shall be controlled by one of the following practices:

1. In "dry" detention basins, provisions shall be made to insure that the runoff from the water quality design storm is retained such that not more than 90 percent will be evacuated prior to 36 hours for all non-residential projects or 18 hours for all residential projects. The retention time shall be considered a brim-drawdown time and, therefore, shall begin at the time of peak storage. The retention time shall be reduced in any case which would require an outlet size diameter of 3 inches or less. Therefore, 3 inch diameter orifice shall be the minimum allowed.

2. In permanent ponds or "wet" basins, the water quality requirements of this ordinance shall be satisfied where the volume of permanent water is at least 3 times the volume of runoff produced by the water quality design storm.
- * 3. Infiltration practices such as dry wells, infiltration basins, infiltration trenches, buffer strips, etc., may be used to satisfy this requirement provided they produce zero runoff from the water quality design storm and allow for complete infiltration within 72 hours. Provisions must be made for continued maintenance of these facilities. Infiltration basins must be designed to show stability for the 10 year storm, should the basin fail.
- * 4. Perimeter drains around septic systems used to either lower the water table or intercept subsurface water flows may be connected to a storm sewer system after receiving approval from the local administrative authority for such systems. Provisions shall be made with the local health officer to permit inspection and testing of the discharge from these drains.
- * 5. Oil/grease separators or catch basins with hoods and sumps may be required in the storm sewer system on sites with the potential to discharge by storm water runoff a substantial amount of these pollutants.

* NJPDES permits may be required for these activities.

4. FLOOD AND EROSION CONTROL STANDARDS

A. Detention Facilities

A detention facility must accommodate site runoff generated from 2 Year, 10 Year and 100 Year 24 Hour Storms considered individually (in each case a Type III Rainfall as defined in Soil Conservation Service Publications). Runoff greater than that occurring from the 100 Year 24 Hour Storm will be passed over an emergency spillway. Detention will be provided such that after development the peak rate of flow from the site will not exceed the corresponding flows which would have been created by similar storms prior to development.

For purposes of computing runoff, all lands in the site shall be assumed, prior to development, to be in good condition (if the lands are open space) or with good cover (if the lands are pastures, brush, or woods) regardless of conditions existing at the time of computation. All agricultural land shall be considered a meadow with good cover prior to development.

All disturbed lands in the site shall be assumed after development to be in poor condition (if the lands are open space). If urban and/or residential districts are used the next Hydrologic Soil Group shall be used for computing curve numbers after development (i.e. a "B" soil would convert to a "C" soil). Type "D" soils would remain the same.

Detention Basins do not reduce the increased volume of runoff caused by development; therefore, the rate control must be adjusted to safely control the increased volume. Release rates may also be tailored to a regionally controlled stormwater plan.

It is possible for flooding in a given watershed to be aggravated by the combined effects of detention basins, if the basins are improperly placed. Detention basins located in downstream areas hold back peak flows so that the flow coincides with the peak flow from upstream. This situation shall be investigated with supporting calculations of downstream effects. Water quality controls shall be required as a minimum in all cases.

Detention basins with a permanent pool of water shall provide safety ledges. Provisions must be made for proper water circulation, control of aquatic plants, and continued maintenance including dredging to maintain proper depth.

Dry detention basins shall be shaped to blend with the natural topography. The bottom of the dry detention basin shall be at least two feet vertically above the seasonal high groundwater table. Dry detention basins shall be graded to provide a positive overland flow. Low flow channels and underdrains shall be considered for assisting positive drainage.

If detention basins are provided through which water passes at times other than following a rainfall, the NJDEP should be consulted concerning design criteria for detention basins on-stream. It will be necessary to pass certain low flows. On-stream detention basin should be planned to the maximum extent possible to control runoff from all upstream watersheds assuming a fully-developed condition. Provisions for contributions or assessments from future upstream developed sites should be coordinated before the construction of an on-stream detention basin.

B. Outlet Devices

In all cases, multiple level outlets or other fully automatic outlets shall be designed so that discharge rates from the development for the design storms will not be increased from what would occur if the development were not constructed. Outlet waters shall be discharged from the development at such locations and velocities as not to cause additional erosion or cause additional channels downstream of the development. No outlets shall be permitted directly into adjacent lands without proof of a zero increase in the rate of runoff and a stability analysis of the offsite channel. If there is no stable outlet downstream, an offsite easement must be obtained to a stable outlet. Outlets from detention facilities shall be designed to function without manual, electric, or mechanical controls.

Location of the principal outlet should allow for easy vehicle access. The outlet structure must be designed to withstand all anticipated pressures and/or loadings. Outlet structures will involve multi-stage outlet systems. The lowest outlet will be designed to achieve prolonged retention requirements for water quality control. The remaining outlets located above the water quality peak detention pool elevation shall control the required design storms.

Debris and sediment will accumulate around the outlet structure. Trash racks with hinges are required to protect the outlet from clogging. The inclined vertical bar rack is recommended for the lower stage outlets to facilitate debris removal. The inside of the outlet structure should be depressed below the lowest outlet to minimize clogging of this outlet due to sedimentation.

C. Dams

Any storm water basin that impounds water through the use of an artificial dike, levee or other barrier and raises the water level 5 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 N.J.A.C. 7:20 the New Jersey Dam Safety Standards. All such dams must be designed, constructed, operated and maintained in compliance with the rules of N.J.A.C. 7:20 as amended and approved by the New Jersey Department of Environmental Protection.

The minimum top width of the embankment shall be 10 feet. Side slopes of the settled embankment should not be less than 3 horizontal to 1 vertical. The minimum elevation to the top of the settled embankment shall be 1 foot above the water surface created by the maximum design storm. Design height of the basin embankment shall be increased 10 percent where hauling equipment is used and 5 percent where compaction equipment is used.

D. Emergency Spillways

Emergency Spillways are required on all detention basins and shall be designed to at least pass the SCS 100 Year, 24 Hour post-developed peak discharge tributary to the detention basin. Detention basins with dams subject to N.J.A.C. 7:20, the New Jersey Dam Safety Standards, shall comply with those Emergency Spillway Requirements.

Emergency spillway shall be located in cut sections wherever possible. Stable channels shall be provided to convey storm water through the emergency spillway to the discharge points.

E. Offsite Drainage

Storm water runoff from areas offsite may be passed across the development site without detention. If the offsite drainage enters the detention basin provided for the development, the detention basin shall be designed to handle this additional flow.

Storm water runoff that originates on site may be passed downstream without control provided an equal amount of offsite drainage is controlled.

This exchange of water shall be permitted only if the site runoff is not more polluted than the corresponding offsite runoff.

F. Uncontrolled Runoff

Since it is difficult to control 100 percent of the development site stormwater runoff, provisions must be made to regulate uncontrolled runoff to the maximum extent practical.

Uncontrolled runoff is storm water flow not tributary to detention basins or other stormwater control facilities on the development site.

The total peak runoff from the site after development can not exceed predeveloped rates, therefore uncontrolled runoff shall be allowed only if:

1. The storm water control facilities onsite are adequately sized to reduce the composite (summation of controlled and uncontrolled) peak rates of runoff to below predeveloped conditions for the entire site.
2. The uncontrolled runoff will not exceed predeveloped peak rates at the point of discharge. Uncontrolled runoff shall be limited to overland and swale flows.

5. JOINT DETENTION FACILITIES

In many instances, the provisions of separate detention facilities for a number of single sites may be more expensive and more difficult to maintain than provisions of joint facilities for a number of sites.

In such cases, the County will be willing to consider provisions of joint detention facilities which will fulfill the requirements of this regulation. In such cases, a properly planned staged program of detention facilities may be approved by the County.

6. REGIONAL STORM WATER PLANNED AREAS

All proposed projects located in a designated regional planning area will be required to comply with the provisions of this section.

- A. The proposed project shall include adequate onsite storm water management controls to satisfy the requirements of Section 3 - Water Quality Control and must accommodate the site runoff generated from the 2 Year 24 Hour Storm such that the maximum rate of runoff will not increase as a result of the proposed development.

- B. In lieu of providing onsite control of the 10 Year and 100 Year Storms, the proposed project shall contribute the required fee towards the implementation of the proposed regional storm water control facilities.

The fee shall be paid to the designated regional storm water planning group upon final planning board approval of the proposed project.

7. DETENTION FACILITIES IN FLOOD HAZARD AREAS

- A. To the extent practical and consistent with other site planning criteria, developments and their stormwater detention facilities shall be beyond the extent of the flood hazard area of a stream.

The flood hazard area is defined as the New Jersey design flood hazard area for delineated streams and the 100 Year Storm for non-delineated streams. The Developer's Engineer is required to calculate the Flood Hazard line for non-delineated streams.

- B. The bottom of the detention basin should be above the flood hazard elevation on site if at all possible. Reductions for detention basin storage below the flood hazard elevation shall be in accordance with the State Storm Water Management Regulations, N.J.A.C. 7:8.
- C. Developers are also required to show compliance with the Flood Hazard Areas Regulations of the Department of Environmental Protection including storm water detention facilities and placement of fill in the flood hazard area if they can not be avoided.

8. STANDARDS FOR STREAM CORRIDOR PROTECTION

To the extent practical and consistent with other site planning criteria, and with appropriate beneficial use of the site as whole, it is recommended that no alteration of the natural terrain shall occur and no impervious surfaces shall be located, within a stream corridor. The corridor includes as a minimum all flood hazard areas, adjacent slopes of 12 percent or greater and contiguous areas where the depth of the seasonal high water table is one foot or less.

9. MAINTENANCE AND REPAIR

Unless assumed by a governmental agency, responsibility for operation and maintenance of storm water management facilities shall remain with the owner or owners of the property with permanent arrangements that it shall pass to any successive owner. The operation and maintenance of detention facilities shall include but not be limited to the periodic removal and disposal of accumulated particulate material and debris. If portions of the land are to be sold, legally binding arrangements shall be made to pass the basic responsibility to successors in title. These arrangements shall designate for each project the property owner, governmental agency, or other legally established entity to be permanently responsible for maintenance.

Prior to granting approval to any project subject to review under this ordinance, the applicant or responsible party shall enter into an agreement with a governmental agency or a legally established entity to ensure the continued operation and maintenance of the storm water management facility. The responsible party may be, but not limited to, a homeowner's association if the property is subdivided and sold separately. This agreement shall be in a form satisfactory to the County Planning Board, governmental agency and entity attorneys, and may include, but may not necessarily be limited to, personal guarantees, deed restrictions, provisions for transfer of responsibility, covenants, and bonds. Penalties for non-compliance with the maintenance requirements will be part of the agreement.

An easement shall be executed with the governmental agency or other entity to ensure the continued operation and maintenance of the storm water management facility. If the responsible party has failed to maintain the storm water management facility, the governmental agency or entity may perform the maintenance and back-charge the owner.

Storm water detention facilities shall be inspected during construction to insure compliance with the approved plans. Record plans and a maintenance inspection schedule must be submitted to the Municipal Engineers of the municipalities in which the facility is located.

The Governmental Agency or Entity Engineer shall perform a formal inspection at least once a year. A report shall be submitted to the Municipality, County and owner covering at least the following:

- A. Plugged or damaged trash racks, outlet structures, and pipes.
- B. Deterioration, if any, of dam.
- C. Soil erosion or lack of vegetation on dam or emergency spillway.
- D. Positive drainage of facility - condition of low flow channel.
- E. Standing water.
- F. Unapproved growth on any berm or dam (i.e.: trees, shrubs).
- G. Muskrat or groundhog damage to embankment.