

Title 26 DEPARTMENT OF THE ENVIRONMENT

Subtitle 17 WATER MANAGEMENT

Chapter 02 Stormwater Management

Authority: Environment Article, §§4-201 and 4-203, Annotated Code of Maryland

.01 Purpose and Scope.

A. The primary goals of the State and local stormwater management programs are to maintain after development, as nearly as possible, the predevelopment runoff characteristics, and to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding by implementing environmental site design to the maximum extent practicable and using appropriate structural best management practices only when necessary.

B. These regulations for stormwater management apply to the development or redevelopment of land for residential, commercial, industrial, or institutional use, but do not apply to agricultural land management practices. This chapter specifies the minimum content of county and municipal ordinances, responsibilities of the Administration regarding the review of the county and municipal stormwater management programs, and approval of State-constructed projects for stormwater management by the Department of the Environment.

C. This chapter applies to all new development and redevelopment projects that do not have final approval for erosion and sediment control and stormwater management plans by May 4, 2010.

26.17.02.01-1

.01-1 Incorporation by Reference.

A. In this chapter, the following documents are incorporated by reference.

B. Documents Incorporated.

- (1) The 2000 Maryland Stormwater Design Manual, Volumes I & II (Maryland Department of the Environment, April 2000), Supplement 1, is incorporated by reference by the Administration and shall serve as the official guide for stormwater management principles, methods, and practices.
- (2) USDA Natural Resources Conservation Service Maryland Conservation Practice Standard Pond Code 378 (January 2000).
- (3) 40 CFR §122.26(b)(14)(i)—(xi).

26.17.02.02

.02 Definitions.

A. The following definitions describe the meaning of terms used in this chapter and the 2000 Maryland Stormwater Design Manual, Volumes I & II. The definitions will be valid unless the context in which they are used clearly requires a different meaning. Terms not defined below shall have the meanings given to them in the relevant statutes or, if not defined in statutes, the meanings attributed by common use. The definitions for these terms are provided below as a convenience, but persons affected by the Department's regulations should be aware that these definitions are subject to amendment by the General Assembly.

B. In this chapter, the following terms have the meanings indicated.

(1) "Administration" means the Water Management Administration.

(2) "Agricultural land management practices" means those methods and procedures used in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.

(3) "Approving agency" means the entity responsible for review and approval of stormwater management plans.

(4) "Aquifer" means a porous water-bearing geologic formation generally restricted to materials capable of yielding an appreciable supply of water.

(5) "Best management practice (BMP)" means a structural device or nonstructural practice designed to temporarily store or treat stormwater runoff in order to mitigate flooding, reduce pollution, and provide other amenities.

(6) "Channel protection storage volume" means the volume used to design structural management practices to control stream channel erosion. Methods for calculating the channel protection storage volume are specified in the 2000 Maryland Stormwater Design Manual, Volumes I & II.

(7) "Concept plan" means the first of three required plan approvals that includes the information necessary to allow an initial evaluation of a proposed project.

(8) "Department" means the Department of the Environment.

(9) "Design Manual" means the 2000 Maryland Stormwater Design Manual, Volumes I & II, that serves as the official guide for stormwater management principles, methods, and practices.

(10) "Detention structure" means a permanent structure for the temporary storage of runoff which is

designed so as not to create a permanent pool of water.

(11) "Develop land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.

(12) "Direct discharge" means the concentrated release of stormwater to tidal waters or vegetated tidal wetlands from new development or redevelopment projects in the Critical Area.

(13) "Direct runoff" means the flow of rainwater, snowmelt, or spring flow over the land surface toward stream channels.

(14) "Drainage area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.

(15) Environmental Site Design.

(a) "Environmental site design (ESD)" means using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources.

(b) "Environmental site design (ESD)" design methods are specified in the Design Manual.

(16) "Extended detention" means a stormwater design feature that provides gradual release of a volume of water in order to increase settling of pollutants and protect downstream channels from frequent storm events. Methods for designing extended detention BMPs are specified in the Design Manual.

(17) "Extreme flood volume" means the storage volume required to control those infrequent but large storm events in which overbank flows reach or exceed the boundaries of the 100-year floodplain.

(18) "Final stormwater management plan" means the last of three required plan approvals that includes the information necessary to allow all approvals and permits to be issued by the appropriate authority.

(19) "Flow attenuation" means prolonging the flow time of runoff to reduce the peak discharge.

(20) "Impervious area" means any surface that does not allow stormwater to infiltrate into the ground.

(21) "Infiltration" means the passage or movement of water into the soil surface.

(22) "Maximum extent practicable (MEP)" means designing stormwater management systems so that all reasonable opportunities for using ESD planning techniques and treatment practices are exhausted and, only where absolutely necessary, a structural BMP is implemented.

(23) "Off-site stormwater management" means the design and construction of a facility necessary to control stormwater from more than one development.

- (24) "On-site stormwater management" means the design and construction of systems necessary to control stormwater within an immediate development.
- (25) "Overbank flood protection volume" means the volume controlled by structural practices to prevent an increase in the frequency of out-of-bank flooding generated by development. Methods for calculating the overbank flood protection volume are specified in the Design Manual.
- (26) "Person" means the federal government, the State, any county, municipal corporation, or other political subdivision of the State, or any of their units, or an individual, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, or any partnership, firm, association, public or private corporation, or any other entity.
- (27) "Planning techniques" means a combination of strategies employed early in project design to reduce impact from development and to incorporate natural features into a stormwater management plan.
- (28) "Recharge volume" means that portion of the water quality volume used to maintain ground water recharge rates at development sites. Methods for calculating the recharge volume are specified in the Design Manual.
- (29) "Redevelopment" means any construction, alteration, or improvement performed on sites where existing land use is commercial, industrial, institutional, or multifamily residential and the existing site impervious area exceeds 40 percent.
- (30) "Retention structure" means a permanent structure that provides for the storage of runoff by means of a permanent pool of water.
- (31) "Retrofitting" means the construction of a structural BMP in a previously developed area, the modification of an existing structural BMP, or the implementation of a nonstructural practice to improve water quality over current conditions.
- (32) "Sediment" means soils or other surficial materials transported or deposited by the action of wind, water, ice, or gravity as a product of erosion.
- (33) "Site" means any tract, lot, parcel of land, or combination of tracts, lots, parcels of land that are in one ownership, or are contiguous and in diverse ownership where development is to be performed as part of a unit, subdivision, or project.
- (34) "Site development plan" means the second of three required plan approvals that includes the information necessary to allow a detailed evaluation of a proposed project.
- (35) "Stormwater" means water that originates from a precipitation event.
- (36) "Stormwater management" means, for:

(a) Quantitative control, a system of vegetative and structural measures that control the increased volume and rate of surface runoff caused by man-made changes to the land; and

(b) Qualitative control, a system of vegetative, structural, and other measures that reduce or eliminate pollutants that might otherwise be carried by surface runoff.

(37) "Stormwater Management Subtitle" means Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland and cumulative supplement.

(38) "Stormwater management system" means natural areas, ESD practices, stormwater management measures, and any other structure through which stormwater flows, infiltrates, or discharges from a site.

(39) "Water quality volume" means the volume needed to capture and treat 90 percent of the average annual runoff volume at a development site. Methods for calculating the water quality volume are specified in the Design Manual.

(40) "Watershed" means the total drainage area contributing runoff to a single point.

26.17.02.03

.03 General Provisions.

A. The Administration is responsible for implementing and supervising the stormwater management program which is established by the Stormwater Management Subtitle. This responsibility shall include, but is not limited to:

- (1) Establishing policies, procedures, standards, model ordinances, and criteria relating to stormwater management;
- (2) Reviewing and approving:
 - (a) County stormwater management ordinances,
 - (b) Municipal stormwater management ordinances,
 - (c) Stormwater management program implementation and operation, and
 - (d) Stormwater management plans for State and federal construction projects which shall be subject to the requirements of this chapter;
- (3) Inspecting and enforcing stormwater management on all State and federal construction projects which shall be subject to the requirements of this chapter;
- (4) Inspection and enforcement in conjunction with local governmental authorities;
- (5) Developing guidelines and regulations;
- (6) Assisting local jurisdictions with improving and maintaining their technical capabilities regarding:
 - (a) Hydrologic and hydraulic analyses,
 - (b) Utilization of State adopted standards and specifications for stormwater management, and
 - (c) Stormwater management plan review;
- (7) Training assistance to local jurisdictions for construction and maintenance inspections of stormwater management systems;
- (8) Developing public educational programs; and

(9) Evaluating the effectiveness of stormwater control measures in eliminating adverse stream quality impacts.

B. Matters of policy, procedures, standards, criteria, approvals, inspection, and enforcement relating to the Stormwater Management Subtitle shall be established by the Administration subject to the jurisdiction of the Secretary of the Environment. The stormwater management programs which are adopted by the counties and municipalities shall include stormwater management criteria consistent with the standards, procedures, and regulations of the Administration. A variation of requirements by a county or municipality on a specific watershed may not be valid unless approved by the Administration. All State and federal development in the watershed shall be reviewed subject to the same variations and requirements by the Administration.

C. Inspection and Review.

(1) Initially, and at least once every 3 years after that, the Administration shall inspect and review the stormwater management programs of the counties and municipalities and evaluate the effectiveness of the programs.

(2) To be found acceptable, a stormwater management program shall have:

(a) An Administration-approved stormwater management ordinance in effect;

(b) Stormwater management planning and approval processes that provide:

(i) Stormwater management for every land development subject to this chapter;

(ii) The implementation of ESD to the MEP; and

(iii) The ability and the information necessary to review adequately proposed installation and maintenance measures for stormwater management;

(c) Inspection and enforcement procedures that ensure the proper construction and maintenance of approved stormwater management measures.

(3) Upon completion of its review and evaluation, the Administration shall submit the findings within 30 days to the appropriate governing authority. The Administration shall also publish the results of the periodic reviews in one document and conduct a public informational meeting concerning the reviews.

D. If a county or municipality is found not to have an acceptable stormwater management program, the Department may:

(1) Issue an order requiring that necessary corrective action be taken within a reasonably prescribed time; or

(2) Impose other sanctions as authorized by law.

E. In order to assure that Administration-approved programs reflect the policies established in the Design Manual, each county or municipality shall submit proposed revisions to its ordinance to the Administration by November 11, 2009. Each county and municipality shall adopt a revised ordinance by May 4, 2010, in order to require that all new development and redevelopment projects implement the policies and practices established in the Design Manual. Descriptions of other program elements shall be submitted as requested by the Administration.

26.17.02.04

.04 Stormwater Management Ordinances.

A. Each county and municipality shall adopt ordinances necessary to implement a stormwater management program. Subsequently, counties and municipalities shall submit any proposed amendments to the Administration for review and approval. By joint action with the county, a municipality may adopt the stormwater management ordinance of its respective county.

B. Each local ordinance shall provide for:

(1) A comprehensive stormwater management plan review and approval process that:

(a) Considers all aspects of project planning, design, and construction from initial conception through final approval;

(b) Requires the submission, review, and approval of interim plans at an increasing level of detail for specific stages of project development;

(c) Provides for coordinated input for all plans from all appropriate agencies including, but not limited to, soil conservation districts and departments of planning, zoning, public works, and environmental protection; and

(d) Requires implementation of ESD to the MEP;

(2) Exemptions and waivers;

(3) Criteria and procedures for stormwater management;

(4) Proper implementation of stormwater management in accordance with the approved plan;

(5) Maintenance responsibilities and requirements including periodic inspection; and

(6) Penalties for noncompliance with the ordinances including suspension of construction activities when appropriate.

26.17.02.05

.05 When Stormwater Management is Required.

A. Unless the particular activity is exempted by this regulation, a person may not develop any land without an approved final stormwater management plan from the approving agency. A grading or building permit may not be issued for a property unless a final stormwater management plan has been approved that is consistent with:

- (1) The Stormwater Management Subtitle;
- (2) This chapter;
- (3) The county or municipal ordinance.
- (4) The Design Manual for new development; and
- (5) Policies established by the local approving agency for redevelopment.

B. The following activities are exempt from the provisions of this chapter:

- (1) Additions or modifications to existing single family detached residential structures if they comply with §B(2) of this regulation;
- (2) Any developments that do not disturb over 5,000 square feet of land area; and
- (3) Land development activities which the Administration determines will be regulated under specific State laws which provide for managing stormwater runoff.

C. Waivers.

(1) County and municipal ordinances may contain waiver policies for individual developments if the ordinances are approved by the Administration. The Administration will approve county and municipal ordinances and waiver policies if:

- (a) They reasonably ensure that a development will not adversely impact stream quality;
- (b) Waiver decisions are made on a case-by-case basis; and
- (c) The cumulative effects of the waiver policy are evaluated.

(2) Stormwater management quantitative control waivers shall be granted only to those projects within

areas where watershed management plans have been developed consistent with §E of this regulation.

(3) If watershed management plans consistent with §E of this regulation have not been developed, stormwater management quantitative control waivers may be granted to projects:

(a) That have direct discharges to tidally influenced receiving waters; or

(b) When the approving agency determines that circumstances exist that prevent the reasonable implementation of quantity control practices.

(4) Stormwater management qualitative control waivers apply only to:

(a) In-fill development projects where stormwater management implementation is not feasible;

(b) Redevelopment projects if the requirements of §D of this regulation are satisfied; or

(c) Sites where the approving agency determines that circumstances exist that prevent the reasonable implementation of quality control practices.

D. Redevelopment.

(1) An approving agency shall require that stormwater management be addressed for redevelopment. Unless otherwise specified by watershed management plans developed according to §E of this regulation, all redevelopment project designs shall do one of the following:

(a) Reduce existing impervious area within the limit of disturbance by at least 50 percent according to the Design Manual;

(b) Implement ESD to the MEP to provide water quality treatment for at least 50 percent of the existing impervious area within the limit of disturbance; or

(c) Use a combination of both §D(1)(a) and (b) of this regulation for at least 50 percent of the existing site impervious area.

(2) Alternative stormwater management measures may be used to meet the requirements in §D(1) of this regulation if the developer satisfactorily demonstrates to the approving agency that impervious area reduction and ESD have been implemented to the MEP. Alternative stormwater management measures include, but are not limited to:

(a) An on-site structural BMP;

(b) An off-site structural BMP to provide water quality treatment for an area equal to or greater than 50 percent of the existing impervious area; or

(c) A combination of impervious area reduction, ESD implementation, and an on-site or off-site structural BMP for an area equal to or greater than 50 percent of the existing site impervious area within the limit of disturbance.

(3) An approving agency may develop separate policies for providing water quality treatment for redevelopment projects if the requirements of §D(1) and (2) of this regulation cannot be met. Any separate redevelopment policy shall be reviewed and approved by the Administration and may include, but not be limited to:

(a) Retrofitting;

(b) Stream restoration;

(c) Pollution trading; or

(d) Design criteria based on watershed management plans developed according to §E of this regulation.

(4) Stormwater management shall be addressed according to the new development requirements in the Design Manual for any net increase in impervious area.

(5) The recharge, channel protection storage volume, and overbank flood protection volume requirements specified in the Design Manual do not apply to redevelopment projects unless specified by the approving agency.

(6) On-site or off-site channel protection storage volume requirements as specified in the Design Manual may be imposed if watershed management plans developed according to §E of this regulation indicate that downstream flooding or erosion need to be addressed.

(7) Variations of this redevelopment policy shall be approved by the Administration.

E. An approving agency may develop quantitative waiver and redevelopment provisions for stormwater management that differ from the requirements of this chapter. These provisions shall be developed only as part of an overall watershed management plan. Watershed management plans developed for the purposes of implementing different stormwater management policies for waivers and redevelopment shall:

(1) Include detailed hydrologic and hydraulic analyses to determine hydrograph timing;

(2) Evaluate both quantity and quality management;

(3) Include cumulative impact assessment of watershed development;

(4) Identify existing flooding and receiving stream channel conditions;

(5) Be conducted at a scale determined by the approving agency; and

(6) Specify where on-site or off-site quantitative and qualitative stormwater management practices are to be implemented.

26.17.02.06

.06 Minimum Control Requirements.

A. County and Municipal Requirements.

(1) The minimum control requirements established in this section and the Design Manual shall be contained in each county and municipal ordinance as they apply to the applicable parts of the State. The minimum control requirements for each county and municipality are provided in §A(2) and (3) of this regulation.

(2) All counties and their incorporated municipalities shall require that the planning techniques, nonstructural and structural practices, and design methods specified in the Design Manual be used to implement ESD to the MEP. Stormwater management plans for development projects subject to this chapter shall be designed using the ESD sizing criteria, recharge volume, water quality volume, and channel protection storage volume criteria according to the Design Manual. The MEP standard is met when channel stability and 100 percent of the average annual predevelopment groundwater recharge are maintained, nonpoint source pollution is minimized, and structural stormwater management practices are used only if determined to be absolutely necessary.

(3) Control of the 2-year frequency storm event, 10-year frequency storm event, or both is required according to the Design Manual if any county or municipality determines that additional stormwater management is necessary because historical flooding problems exist and downstream floodplain development and conveyance system design cannot be controlled.

(4) An approving agency may require more than the minimum control requirements specified in this regulation if hydrologic or topographic conditions warrant or if flooding, stream channel erosion, or water quality problems exist downstream from a proposed project.

B. Alternate minimum control requirements may be adopted subject to Administration approval. The Administration shall require a demonstration that alternative requirements will implement ESD to the MEP and control flood damages, accelerated stream erosion, water quality, and sedimentation, including, if necessary, address comprehensive watershed studies.

C. Development in watersheds designated as interjurisdictional flood hazard watersheds within this chapter may not increase the downstream peak discharge for the 100-year frequency storm event and shall comply with flood management plans as approved by the Department in accordance with the Flood Hazard Management Act of 1976 (Environment Article, Title 5, Subtitle 8, Annotated Code of Maryland).

26.17.02.07

.07 Interjurisdictional Flood Hazard Watersheds.

A. The watersheds specified in this regulation are interjurisdictional in nature and have documented flood damages to residential, commercial, industrial, or institutional structures. Development in the interjurisdictional flood hazard watershed may not increase the downstream peak discharge for the 100-year frequency storm event. Additionally, development shall comply with flood management plans as approved by the Department in accordance with the Flood Hazard Management Act of 1976 (Environment Article, Title 5, Subtitle 8, Annotated Code of Maryland). The following watersheds and all their tributaries are designated as interjurisdictional flood hazard watersheds:

- (1) Carroll Creek in Frederick City and Frederick County;
- (2) Gwynns Falls in Baltimore City and Baltimore County; and
- (3) Jones Falls in Baltimore City and Baltimore County.

B. The Administration shall periodically review watersheds to be included as interjurisdictional flood hazard watersheds for the purposes of this chapter. Any additional interjurisdictional watershed to be designated will be considered with respect to the:

- (1) Economic losses due to flood damages;
- (2) Expected upstream development;
- (3) Frequency of flooding;
- (4) Number and value of structures flooded; and
- (5) Threat to life.

26.17.02.08

.08 Stormwater Management Measures.

A. The ESD planning techniques and practices and structural stormwater management measures established in this regulation and the Design Manual shall be contained in all county and municipal ordinances. Each ordinance shall require that a developer demonstrate that ESD has been implemented to the MEP and, only where absolutely necessary, is a structural BMP used in developing a stormwater management plan.

B. ESD Planning Techniques and Practices.

(1) The following planning techniques shall be applied according to the Design Manual to satisfy the minimum control requirements established in Regulation .06 of this chapter:

- (a) Preserving and protecting natural resources;
- (b) Conserving natural drainage patterns;
- (c) Minimizing impervious area;
- (d) Reducing runoff volume;
- (e) Using ESD practices to maintain 100 percent of the average annual predevelopment groundwater recharge volume for the site;
- (f) Using green roofs, permeable pavement, reinforced turf, and other alternative surfaces;
- (g) Limiting soil disturbance, mass grading, and compaction;
- (h) Clustering development; and.
- (i) Any practices approved by the Administration.

(2) The following ESD treatment practices shall be designed according to the Design Manual to satisfy the minimum control requirements established in Regulation .06 of this chapter:

- (a) Disconnection of rooftop runoff;
- (b) Disconnection of nonrooftop runoff;
- (c) Sheetflow to conservation areas;

- (d) Rainwater harvesting;
- (e) Submerged gravel wetlands;
- (f) Landscape infiltration;
- (g) Infiltration berms;
- (h) Dry wells;
- (i) Micro-bioretenion;
- (j) Rain gardens;
- (k) Swales;
- (l) Enhanced filters; and
- (m) Any practices approved by the Administration.

(3) The use of the ESD planning techniques and treatment practices specified in this section may not conflict with existing State law or local ordinances, regulations, or policies. Counties and municipalities shall modify planning and zoning ordinances and public works codes to eliminate any impediments to implementing ESD to the MEP according to the Design Manual.

C. Structural Stormwater Management Measures.

(1) The following structural stormwater management practices shall be designed according to the Design Manual to satisfy the applicable minimum control requirements established in Regulation .06 of this chapter:

- (a) Stormwater management ponds;
- (b) Stormwater management wetlands;
- (c) Stormwater management infiltration;
- (d) Stormwater management filtering systems; and
- (e) Stormwater management open channel systems.

(2) The performance criteria specified in the Design Manual with regard to general feasibility, conveyance, pretreatment, treatment and geometry, environment and landscaping, and maintenance shall be

considered when selecting structural stormwater management practices.

(3) Structural stormwater management practices shall be selected to accommodate the unique hydrologic or geologic regions of the State.

D. County and municipal ordinances shall specify that the ESD planning techniques and treatment practices and structural stormwater management measures used to satisfy the minimum control requirements in Regulation .06 of this chapter are documented and remain unaltered by subsequent property owners. Approval from the appropriate approving agency should be obtained before any stormwater management practice is altered.

E. Alternative ESD planning techniques and treatment practices and structural stormwater management measures may be used for new development runoff control if they meet the performance criteria established in the Design Manual and are approved by the Administration. Practices used for redevelopment projects shall be approved by the appropriate approving agency.

F. For purposes of modifying the minimum control requirements or design criteria, the owner/developer shall submit to the approving agency an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development upon a dam, highway, structure, or natural point of restricted streamflow, established with the concurrence of the approving agency, downstream of the first downstream tributary whose drainage area equals or exceeds the contributing area to the project or stormwater management facility.

26.17.02.09

.09 Stormwater Management Plans.

A. The design of stormwater management plans shall be prepared by any individual whose qualifications are acceptable to the approving agency. The approving agency may require that the design be prepared by either a professional engineer, professional land surveyor, or landscape architect licensed in the State, as necessary to protect the public or the environment. If a stormwater BMP requires either a dam safety permit from the Department or small pond approval by the appropriate soil conservation district, the approving agency shall require that the design be prepared by a professional engineer licensed in the State.

B. Stormwater management and development plans shall be consistent with adopted and approved watershed management plans or flood management plans as approved by the Department in accordance with the Flood Hazard Management Act of 1976 (Environment Article, Title 5, Subtitle 8, Annotated Code of Maryland).

C. An operation and maintenance plan shall be required as a condition of stormwater management plan approval.

D. If a stormwater management plan involves direction of some or all runoff off of the site, it is the responsibility of the developer to obtain from adjacent property owners any easements or other necessary property interests concerning flowage of water. Approval of a stormwater management plan does not create or affect any right to direct runoff onto adjacent property without that property owner's permission.

E. Contents and Submission of Stormwater Management Plans.

(1) The owner/developer is responsible for submitting phased stormwater management plans for development projects according to the comprehensive review and approval process specified in Regulation .04 of this chapter, the Design Manual, and county and municipal stormwater management ordinances. Plans shall be submitted for the concept, site development, and final stormwater management construction phases of project design. Comments from the appropriate approval authority shall be addressed and approval received at each phase of project design before subsequent submissions.

(2) The owner/developer shall submit a concept plan that provides sufficient information for an initial assessment of the proposed project and whether stormwater management can be provided according to this chapter and the Design Manual. Plans submitted for concept approval shall include, but are not limited to:

(a) A map at a scale specified by the appropriate approval authority showing site location, existing natural features, water and other sensitive resources, topography, and natural drainage patterns;

(b) The anticipated location of all proposed impervious areas, buildings, roadways, parking, sidewalks,

utilities, and other site improvements;

(c) The location of the proposed limit of disturbance, erodible soils, steep slopes, and areas to be protected during construction;

(d) Preliminary estimates of stormwater management requirements, the selection and location of ESD practices to be used, and the location of all points of discharge from the site;

(e) A narrative that supports the concept design and describes how ESD will be implemented to the MEP; and

(f) Any other information required by the approving Agency.

(3) Following concept plan approval by the appropriate authority, the owner or developer shall submit site development plans that reflect comments received during the previous review phase. Plans submitted for site development approval shall be of sufficient detail to allow site development to be reviewed and include but not be limited to:

(a) All information provided during the concept plan review phase;

(b) Final site layout, exact impervious area locations and acreages, proposed topography, delineated drainage areas at all points of discharge from the site, and stormwater volume computations for ESD practices and quantity control structures;

(c) A proposed erosion and sediment control plan that contains the construction sequence, any phasing necessary to limit earth disturbances and impacts to natural resources, and an overlay plan showing the types and locations of ESD and erosion and sediment control practices to be used;

(d) A narrative that supports the site development design, describes how ESD will be used to meet the minimum control requirements, and justifies any proposed structural stormwater management measure; and

(e) Any other information required by the approving Agency.

(4) Following site development approval by the appropriate authority, the owner/developer shall submit final erosion and sediment control and stormwater management plans that reflect the comments received during the previous review phase. Plans submitted for final approval shall be of sufficient detail to allow all approvals and permits to be issued according to the following:

(a) Final erosion and sediment control plans shall be submitted according to COMAR 26.17.01.05; and

(b) Final stormwater management plans shall be submitted for approval in the form of construction drawings and be accompanied by a report that includes sufficient information to evaluate the effectiveness of the proposed runoff control design.

(5) Reports submitted for final stormwater management plan approval shall include, but are not limited to:

- (a) Geotechnical investigations including soil maps, borings, site-specific recommendations, and any additional information necessary for the final stormwater management design;
- (b) Drainage area maps depicting predevelopment and postdevelopment runoff flow path segmentation and land use;
- (c) Hydrologic computations of the applicable ESD and unified sizing criteria according to the Design Manual for all points of discharge from the site;
- (d) Hydraulic and structural computations for all ESD practices and structural stormwater management measures to be used;
- (e) A narrative that supports the final stormwater management design; and
- (f) Any other information required by the approving agency.

(6) Construction drawings submitted for final stormwater management plan approval shall include, but are not limited to:

- (a) A vicinity map;
- (b) Existing and proposed topography and proposed drainage areas, including areas necessary to determine downstream analysis for the proposed stormwater management facilities;
- (c) Any proposed improvements including the location of buildings or other structures, impervious surfaces, storm drainage facilities, and all grading;
- (d) The location of existing and proposed structures;
- (e) Any easements and rights-of-way;
- (f) The delineation, if applicable, of the 100-year floodplain and any on-site wetlands;
- (g) Structural and construction details including representative cross sections for all components of the proposed drainage system or systems and stormwater management facilities;
- (h) All necessary construction specifications;
- (i) A sequence of construction;
- (j) Data for total site area, disturbed area, new impervious area, and total impervious area;

- (k) A table showing the ESD and unified sizing criteria volumes required in the Design Manual;
- (l) A table of materials to be used for stormwater management facility planting;
- (m) All soil boring logs and locations;
- (n) An inspection and maintenance schedule;
- (o) Certification by the owner/developer that all stormwater management construction will be done according to this plan;
- (p) An as-built certification signature block to be executed after project completion; and
- (q) Any other information required by the approving agency.

26.17.02.10

.10 Construction Inspection and Enforcement.

A. Before Beginning Construction.

- (1) All county and municipal ordinances shall require:
 - (a) Advance notification of the beginning of construction by the owner/developer;
 - (b) Documented regular inspections during construction of stormwater management systems;
 - (c) Certification by a professional engineer licensed in the State documenting that structural practices have been constructed according to approved plans; and
 - (d) Effective enforcement procedures to ensure compliance with approved stormwater management plans.
- (2) The owner/developer shall notify the appropriate approving agency at least 48 hours before beginning any work in conjunction with stormwater management system construction.
- (3) Inspections shall be conducted by county or municipal staff or certified by a professional engineer licensed in the State. The periodic inspections shall be documented and reports maintained by the county or municipality. Written reports shall be prepared for every inspection and include:
 - (a) The date and location of the inspection;
 - (b) Whether construction was in compliance with the approved stormwater management plan;
 - (c) Any variations from the approved construction specifications; and
 - (d) Any violations that exist.
- (4) The owner/developer and on-site personnel shall be notified in writing when violations are observed. Written notification shall describe the nature of the violation and the required corrective action.
- (5) Work may not proceed until the work previously completed is approved by the appropriate inspection authority.

B. Regular inspections shall be made and documented for each ESD planning technique and practice at the stages of construction specified in the Design Manual. At a minimum, all ESD and other nonstructural practices shall be inspected upon completion of final grading, the establishment of permanent stabilization, and before issuance of use and occupancy approval.

C. At a minimum, regular inspections shall be made and documented at the following specified stages of construction:

(1) For ponds:

(a) Upon completion of excavation to sub-foundation and, when required, installation of structural supports or reinforcement for structures, including but not limited to:

(i) Core trenches for structural embankments,

(ii) Inlet and outlet structures, anti-seep collars or diaphragms, and watertight connectors on pipes, and

(iii) Trenches for enclosed storm drainage facilities;

(b) During placement of structural fill, concrete, and installation of piping and catch basins;

(c) During backfill of foundations and trenches;

(d) During embankment construction; and

(e) Upon completion of final grading and establishment of permanent stabilization;

(2) Wetlands—at the stages specified for pond construction in §B(1) of this regulation, during and after wetland reservoir area planting, and during the second growing season to verify a vegetation survival rate of at least 50 percent;

(3) For infiltration trenches:

(a) During excavation to subgrade;

(b) During placement and backfill of under drain systems and observation wells;

(c) During placement of geotextiles and all filter media;

(d) During construction of appurtenant conveyance systems such as diversion structures, pre-filters and filters, inlets, outlets, orifices, and flow distribution structures; and

(e) Upon completion of final grading and establishment of permanent stabilization;

(4) For infiltration basins—at the stages specified for pond construction in §B(1) of this regulation and during placement and backfill of under drain systems;

(5) For filtering systems:

(a) During excavation to subgrade;

(b) During placement and backfill of under drain systems;

(c) During placement of geotextiles and all filter media;

(d) During construction of appurtenant conveyance systems such as flow diversion structures, pre-filters and filters, inlets, outlets, orifices, and flow distribution structures; and

(e) Upon completion of final grading and establishment of permanent stabilization; and

(6) For open channel systems:

(a) During excavation to subgrade;

(b) During placement and backfill of under drain systems for dry swales;

(c) During installation of diaphragms, check dams, or weirs; and

(d) Upon completion of final grading and establishment of permanent stabilization.

D. The county or municipality responsible for inspection and enforcement of approved stormwater management plans may, for enforcement purposes, use any one or a combination of the following actions:

(1) A notice of violation shall be issued specifying the need for the violation to be corrected if stormwater management plan noncompliance is identified;

(2) A stop work order shall be issued for the site by the county or municipality if a violation persists;

(3) Bonds or securities may be withheld or the case may be referred for legal action if reasonable efforts to correct the violation have not been undertaken; or

(4) In addition to any other sanctions, a civil action or criminal prosecution may be brought against any person in violation of the Stormwater Management Subtitle or this chapter.

E. Any step in the enforcement process may be taken at any time, depending on the severity of the violation.

F. Once construction is complete, as-built plan certification shall be submitted by either a professional engineer or professional land surveyor licensed in the State to ensure that ESD planning techniques, treatment practices, and structural stormwater management measures and conveyance systems comply

with the specifications contained in approved plans. At a minimum, as-built certification shall include a set of drawings comparing the approved stormwater management plan with what was constructed. Other information shall be submitted as required by the approving agency.

G. Each county or municipality shall submit notice of construction completion to the Administration on a form supplied by the Administration for each stormwater management practice within 45 days of construction completion. If BMPs requiring soil conservation district approval are constructed, notice of construction completion shall also be submitted to the appropriate soil conservation district.

26.17.02.11

.11 Maintenance.

A. Maintenance requirements established in this regulation shall be contained in all county and municipal ordinances and shall provide for inspection and maintenance. The owner shall perform or cause to be performed preventive maintenance of all completed ESD treatment practices and structural stormwater management measures to ensure proper functioning. The responsible agency of the county or municipality shall ensure preventive maintenance through inspection of all stormwater management systems. The inspection shall occur during the first year of operation and then at least once every 3 years after that.

B. Inspection reports shall be maintained by the county or municipality on all stormwater management systems and shall include the following:

- (1) The date of inspection;
- (2) Name of inspector;
- (3) The condition of:
 - (a) Vegetation or filter media;
 - (b) Fences or other safety devices;
 - (c) Spillways, valves, or other control structures;
 - (d) Embankments, slopes, and safety benches;
 - (e) Reservoir or treatment areas;
 - (f) Inlet and outlet channels or structures;
 - (g) Underground drainage;
 - (h) Sediment and debris accumulation in storage and forebay areas;
 - (i) Any nonstructural practices to the extent practicable; and
 - (j) Any other item that could affect the proper function of the stormwater management system;
- (4) Description of needed maintenance.

C. County and municipal ordinances shall provide procedures to ensure that deficiencies indicated by inspections are rectified. The procedures shall include the following:

- (1) Notification to the owner of deficiency including a time frame for repairs;
- (2) Subsequent inspection to ensure completion of repairs; and
- (3) Effective enforcement procedures if repairs are not undertaken or are not done properly.

26.17.02.9999

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