



Sediment and Stormwater Guidelines and Procedures

Maryland Department of Transportation State Highway Administration

Version 1.4

October 6, 2017

This document is organized into three parts:

Part A-Sediment and Stormwater Guidelines

The Guidelines provide the minimum erosion/sediment control and stormwater management requirements for plans submitted to the MDOT SHA Plan Review Division (PRD) for review and approval.

Part B-Sediment and Stormwater Administrative Procedures

The administrative procedures contain information related to MDOT SHA's plan submission, review, approval, and compliance process. This document will be updated as questions arise, procedures evolve, or resolutions are needed.

Part C-Sediment and Stormwater Technical Procedures

This document contains supplements to the 2011 Maryland Standards and Specifications for Soil Erosion, the 2000 Maryland Stormwater Design Manual, and other clarifications as needed. This document will be updated periodically as questions arise, procedures evolve, or resolutions are needed.

If there are any questions or comments regarding these Guidelines or Procedures, please contact the Plan Review Division in the Office of Highway Development of the MDOT State Highway Administration at 888-228-6971.

Part A

Sediment and Stormwater

Guidelines

Maryland State Highway Administration

Version 1.4
October 6, 2017

Errata

The following corrections have been made to Part A of this document as part of version 1.2:

| Page | Item |
|--------------|--|
| Inside Cover | The first sentence contained a typo “threewo” that has been corrected to “three” |
| A-11 | In Section 3.3.B.1.c the word “or” was moved from the end of item ii to the correct location at the end of item i. |
| A-11 | In Section 3.3.B.2.c the word “or” was moved from the end of item ii to the correct location at the end of item i. |

The following changes have been made to Part A of this document as part of version 1.4:

| Page | Item |
|-----------------|---|
| Entire Document | References to Maryland State Highway Administration have been replaced by Maryland Department of Transportation State Highway Administration. References to SHA have been replaced by MDOT SHA References to SHA-PRD have been replaced by PRD Sections that have been revised in addition to the above-mentioned items are noted in the Table of Contents |
| A-16 | In Section 4.2.D the extraneous word “be” was removed. |

INTRODUCTION

The Environment Article, Title 4, Subtitle 1 requires the Maryland Department of the Environment (MDE) to implement a statewide erosion/sediment control program to control sediment-laden runoff from land disturbing activities. MDE's obligation in meeting this mandate includes adopting regulations that establish criteria and procedures for erosion/sediment control throughout Maryland. The Environment Article, Title 4, Subtitle 2 requires MDE to implement a statewide stormwater management program to control runoff from development. To meet this mandate, MDE has adopted regulations that establish criteria and procedures for managing stormwater throughout Maryland.

The Stormwater Management Act of 2007 (the Act) requires that the Code of Maryland Regulations (COMAR) be modified and guidance and ordinances be developed for the purpose of implementing environmental site design (ESD) to the maximum extent practicable (MEP) on all development projects. The Act defines ESD as "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." ESD promotes conserving natural features, drainage patterns, and vegetation; minimizing impervious surfaces; slowing down runoff; and increasing infiltration. Significant changes to COMAR and the "2000 Maryland Stormwater Design Manual, Volumes I & II" (Design Manual) were adopted in May 2009. These changes specify that ESD is to be implemented, that the MEP standard is to be met, and that the reviews of stormwater management and erosion/sediment control plans are to be integrated via a comprehensive review process.

In January 2012, MDE adopted revised erosion/sediment control regulations, along with the "2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control" (Standards and Specifications). The revisions include more stringent stabilization requirements and the establishment of grading unit criteria. Additionally, the Standards and Specifications now describe how an erosion/sediment control plan will be designed in concert with a site's stormwater management plan as required by the Act. As part of this approach, the erosion/sediment control regulations require developers, designers, and plan review agencies to consider erosion/sediment control of runoff from the start of the land development design process. Adhering to the planning principles found in the Standards and Specifications should result in development that better fits existing site conditions and reduces both the extent and duration of soil disturbance during construction.

On July 8, 2014, the Maryland Department of Transportation State Highway Administration (MDOT SHA) and MDE signed a Memorandum of Understanding (MOU) by which MDE designated approving authority for erosion and sediment control and stormwater management plans for MDOT SHA projects to MDOT SHA. This MOU is in accordance with the provisions of COMAR Environmental Article, Title 4, Subtitle 1, Sediment Control and Title 4, Subtitle 2, Stormwater Management as amended through House Bill 97 effective October 1, 2013. The "MDOT SHA Sediment and Stormwater Guidelines and Procedures" represents the next step toward meeting obligations under current law and serve as guidance for developing, reviewing, and approving both erosion/sediment control and stormwater management plans for MDOT SHA projects. The definition of ESD, as well as the procedures, practices, and minimum plan contents specified herein will guide MDOT SHA in submitting stormwater management and erosion/sediment control plans to MDOT SHA Plan Review Division (PRD).

Part A-Table of Contents

| | <u>Page</u> |
|--|-------------|
| 1.0 Purpose and Authority | A-1 |
| 1.1 Reference Material | |
| 2.0 Definitions (v1.4)..... | A-2 |
| 3.0 Applicability | A-10 |
| 3.1 Scope (v1.4) | |
| 3.2 Exemptions | |
| 3.3 Stormwater Management Waivers | |
| 3.4 Variances | |
| 3.5 General Approvals | |
| 3.6 Classification of Development | |
| A. New Development | |
| B. Redevelopment | |
| C. Combination of New Development and Redevelopment | |
| 4.0 Stormwater Management Criteria..... | A-14 |
| 4.1 Minimum Control Requirements for New Development | |
| 4.2 Minimum Control Requirements for Redevelopment | |
| 4.3 Specific Design Criteria | |
| 5.0 Stormwater Management Measures..... | A-18 |
| 5.1 ESD Planning Techniques | |
| 5.2 ESD Practices | |
| A. Alternative Surfaces | |
| B. Nonstructural Practices | |
| C. Micro-scale Practices | |
| 5.3 Structural Stormwater Management Practices | |
| 5.4 Alternative Stormwater Management Measures | |
| 5.5 Compensatory Stormwater Management | |
| 5.6 Institutional Stormwater Management Plan | |
| 6.0 Erosion/Sediment Control Criteria | A-22 |
| 6.1 Principles | |
| 6.2 Stabilization | |
| 6.3 Grading (v1.4) | |
| 6.4 Design Methodology | |

Table of Contents (continued)

| | <u>Page</u> |
|--|-------------|
| 7.0 Plans | A-24 |
| 7.1 Plan Submission (v1.4) | |
| 7.2 Preparation of Plans | |
| 7.3 Review and Approval of Plans (v1.4) | |
| 7.4 Contents of Plans | |
| A. Concept Design | |
| B. Site Development Design | |
| C. Final Design | |
| D. Report | |
| E. Construction Plans (v1.4) | |
| 8.0 After Plan Approval..... | A-37 |
| 8.1 Prior to and During Construction | |
| 8.2 Inspection Requirements for As-Built Certification | |
| 8.3 Post Construction | |
| 9.0 Compliance | A-40 |
| 10.0 Maintenance..... | A-40 |
| 11.0 Additional Approvals..... | A-41 |
| 12.0 Tables (v1.3) | A-42 |

1.0 PURPOSE AND AUTHORITY

The purpose of the Guidelines is to protect, maintain, and enhance the public health, safety, and general welfare by establishing minimum requirements and procedures to mitigate soil erosion, minimize the discharge of pollutants, and reduce the adverse impacts associated with increased stormwater runoff. The goal is to manage stormwater by using environmental site design (ESD) to the maximum extent practicable (MEP) to reduce stream channel erosion, pollution, siltation, sedimentation, and local flooding and to use appropriate structural best management practices (BMPs) only when necessary. The intent of ESD is to restore, enhance, and maintain the chemical, physical, and biological integrity of streams, minimize damage to public and private property, and reduce the adverse impacts of land development.

The provisions of the Guidelines are pursuant to the Annotated Code of Maryland, Environment Article, Title 4, Subtitles 1 and 2, the Erosion and Sediment Control Regulations, Code of Maryland Regulations (COMAR) 26.17.01, and the Stormwater Management Regulations, COMAR 26.17.02. The Guidelines provide the minimum erosion/sediment control and stormwater management requirements for plans submitted by MDOT SHA to PRD for review and approval. These guidelines do not affect the validity of any portion of either the Environment Article or COMAR.

1.1 Reference Material

The following documents complement the Guidelines:

- A. The *2000 Maryland Stormwater Design Manual Volumes I & II*, MDE, April 2000 and *Supplement 1*, MDE, May 2009 and any subsequent revisions (Design Manual) serving as the official guide for stormwater principles, methods, and practices;
- B. The *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control*, MDE, December 2011 and any subsequent revisions (Standards and Specifications) serving as the official guide for erosion/sediment control standard principles, details, practices, and specifications;
- C. The *Conservation Practice Standard, Pond Code 378*, United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Maryland, January 2000, or latest revision, (Pond Code 378) serving as the official guide for small pond principals, methods, and practices;
- D. The *Sediment and Stormwater Procedures for Maryland Department of Transportation State Highway Administration Projects*, MDOT SHA Plan Review Division as updated, (Procedures) serving as the standard procedures for the design, submittal, review, and approval of MDOT SHA projects; and,
- E. The *SHA Field Guide for Erosion and Sediment Control* (Field Guide), as updated.

2.0 DEFINITIONS

For the purpose of the Guidelines, the definitions below describe the meaning of the following terms:

1. “Adverse impact” means any deleterious effect on waters or wetlands, including changes to quality, quantity, surface area, species composition, aesthetics or usefulness for human or natural uses which are or may potentially be harmful or injurious to human health, welfare, safety or property, to biological productivity, diversity, or stability or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation.
2. “Applicant” means any of the MDOT SHA entities requesting official approval of sediment and stormwater plans or associated documents to carry out construction or maintenance activities of a project or site required to obtain regulatory approval of such.
3. “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, or provide other amenities.
4. “Channel protection storage volume (Cpv)” means the volume used to design stormwater management practices to control stream channel erosion. For environmental site design (ESD), Cpv represents the portion of the ESD volume requirement beyond one inch of rainfall. See also “recharge volume,” “water quality volume” and “environmental site design (ESD).”
5. “Clear” means any activity which removes the vegetative cover while leaving the root mat intact.
6. “Concept plan” means the first of three required plan approvals that includes the information necessary to allow an initial evaluation of a proposed project as described in Section 7.4.A. See also “site development plan” and “final plan”.
7. “Critical Area” means all land within 1,000 feet of tidal waters or adjacent tidal wetlands to the Chesapeake and Atlantic Coastal Bays and their tributaries.
8. “Design Manual” means the *2000 Maryland Stormwater Design Manual and the 2009 Supplement* which serves as the official guide for stormwater management principles, methods, and practices.
9. “Detention structure” means a permanent structure that provides temporary storage to control stormwater runoff to prevent an increase in downstream channel erosion and decrease the frequency of overbank flooding without creating a permanent pool of water within the structure.

10. "Develop land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.
11. "Development activity" means an activity that develops land.
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. "Disturbance" means an activity by which the surface cover is removed or altered, therefore making the soil susceptible to erosion.
14. "Drainage area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line. When runoff leaves the limit of disturbance or right-of-way line as concentrated flow, the "drainage area" means the area from which all water drains to the point of investigation. When runoff leaves the limit of disturbance or right-of-way as sheet flow, the "drainage area" means the area from which all water drains to the line of investigation.
15. "Dry weather period" means a forecasted period with a maximum chance of precipitation of 20 percent each day, as determined by the National Oceanic and Atmospheric Administration (NOAA), for a specified number of consecutive days for the region (ZIP code) in which the project is located.
16. "Easement" means a grant or reservation by the owner of land for the use of such land, or a portion thereof, by others for a specific purpose or purposes and which must be included in the conveyance of land affected by such easement.
17. "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. Methods for designing ESD practices are specified in the Procedures and the *2000 Maryland Stormwater Design Manual Volumes I & II*.
18. "Erosion" means the process by which the land surface is worn away by the action of wind, water, ice, or gravity.
19. "Erosion and sediment control" means a system of protective measures, devices, and techniques that minimize soil erosion and off-site sedimentation.
20. "Erosion and sediment control plan" means an erosion/sediment control strategy and plan, designed in accordance with the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control* and prepared and approved in accordance with the Guidelines and Procedures, that minimizes erosion and prevents off-site sedimentation by containing sediment on-site or passing

- sediment-laden runoff through sediment control measures before being released from the site.
21. “Exemption” means those land development activities that are not subject to erosion/sediment control and/or stormwater management approval.
 22. “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 *2000 Maryland Stormwater Design Manual Volumes I & II*.
 23. “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.
 24. “Federal unit” means any federal agency that intends to or does clear, grade, transport, or otherwise disturb the land or soil surface in the course of its activities.
 25. “Final plan” means the last of three required plans that includes the information necessary to allow approval by PRD and the issuance of permits by MDE as described in Section 7.4.C. See also “concept plan” and “site development plan.”
 26. “Flow attenuation” means prolonging the flow time of runoff to reduce the peak discharge.
 27. “Grade” means to cause the disturbance of the earth. This includes, but is not limited to excavating, filling, stockpiling of earth materials, grubbing, or disturbance of root mat or topsoil.
 28. “Grub” means to expose the earth by removal of the root mat. It may also include the removal of tree stumps and other embedded items.
 29. “Highly erodible soils” means those soils with a slope greater than 15 percent or those soils with a soil erodibility factor, K, greater than 0.35 and having slopes greater than 5 percent.
 30. “Impervious area” means any surface that does not allow stormwater to infiltrate into the underlying soil. Examples include pavement, rooftops, and certain gravel surfaces used for vehicular traffic.
 31. “Impervious area requiring treatment (IART)” means the total impervious area that shall be treated for water quality to satisfy stormwater management requirements as outlined in the Procedures.
 32. “Infiltration” means the passage or movement of water into the soil.

33. “Institutional management plan (IMP)” means an approved, long-term, concept plan developed by MDOT SHA that addresses stormwater management and future development for an institution on an overall watershed basis.
34. “Limit of disturbance (LOD)” means the boundary outside of which earth disturbance is not permitted to occur.
35. “Line of investigation (LOI)” means a location where runoff from a drainage area sheet flows from the project site. See also “point of investigation (POI)”.
36. “Maintenance” means an activity whose purpose is to repair or restore an asset to its original function. With regard to disturbance of impervious surfaces it means pavement overlay, patching, and certain, limited in-kind replacement of deteriorated impervious surfaces, as well as the replacement of impervious surfaces removed for the purpose of underground utility and pipe work. Maintenance activities in accordance with this document are not considered to be redevelopment.
37. “Maximum extent practicable (MEP)” means designing stormwater management systems such that all reasonable opportunities for using ESD planning techniques and treatment practices are exhausted, and only where absolutely necessary are structural BMPs implemented.
38. “MDE” refers to Maryland Department of the Environment, Water Management Administration.
39. “MDE approved sediment control device or practice” means any control found in the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control* that when designed and installed per these standards, and when maintained to ensure proper function, provides adequate treatment for a specific drainage area.
40. “New construction” means the construction of impervious area over an existing pervious area. “New construction” is not interchangeable with the definition for “new development”. “New construction” refers to the construction activity, and “new development” refers to the classification of development. “New construction” is always “new development”, but not all “new development” is “new construction.”
41. “New development” means any new construction performed on existing pervious area as well as any reconstruction or alteration performed on existing impervious area for which the existing percentage of impervious area within the stormwater study area is 40 percent or less, at a project site where the existing land use is commercial, industrial, institutional, or multifamily residential. “New development” refers to the development classification and is not interchangeable with the definition of “new construction”.

42. “Off-site stormwater management” means a BMP or stormwater system located outside the project site and designed and constructed to control stormwater from one or more sites.
43. “On-site stormwater management” means a BMP or stormwater system designed and constructed to control stormwater within the project site.
44. “Overbank flood protection volume (Q_P)” means the volume of stormwater runoff controlled by BMPs 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 *2000 Maryland Stormwater Design Manual Volumes I & II*.
45. “Owner/developer” means the person undertaking, or for whose benefit, any or all of the activities covered by the Guidelines commences or is carried on. This is not necessarily the land owner. General contractors, subcontractors, or both, without a proprietary interest in a project are not considered within this definition.
46. “ P_E ” represents the rainfall, in inches, used to determine ESD goals and size practices. Target rainfall (P_E) is listed in Table 5.3 of the *2000 Maryland Stormwater Design Manual Volumes I & II*.
47. “Planning techniques” means a combination of strategies employed early in project design to reduce the impact from development and to incorporate natural features into a stormwater management plan.
48. “Point of investigation (POI)” means a location where concentrated runoff from a drainage area flows from the project site. References within these guidelines to POI also extend to LOI.
49. “Post-development” means conditions that result from the completion of the proposed project. Post-development conditions are commonly referred to as proposed conditions.
50. “Pre-development” means conditions that exist prior to the conception of the proposed project. Pre-development conditions are commonly referred to as existing conditions.
51. “Professional engineer” means an engineer duly registered by the State to practice engineering in accordance with the provisions of Business Occupations and Professions Article, Title 14, Annotated Code of Maryland.
52. “Project site” means a location, bounded by the limit of disturbance, where development is proposed or occurring.
53. “Pollution” means the contamination or other alteration of the physical, chemical, or biological properties of any waters of the State, including changes in

temperature, taste, color, turbidity, or odor of the waters, or the discharge or deposit of any organic matter, harmful organisms, liquids, gaseous materials, solids, radioactive materials, or other substances into any waters of the State that may render the water harmful, detrimental, or injurious to:

- a. Public health, safety, or welfare;
 - b. Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or
 - c. Livestock, wild animals, birds, fish, or other aquatic life.
54. “Recharge volume (Rev)” means that portion of the water quality volume used to maintain groundwater recharge rates at development sites.
55. “Reconstruction” means the removal of an existing impervious area and construction of a new impervious area within the same footprint.
“Reconstruction” is not interchangeable with the definition of “redevelopment”.
“Reconstruction” refers to the construction activity, and “redevelopment” refers to the classification of development. “Redevelopment” is always “reconstruction,” but not all “reconstruction” is “redevelopment.”
56. “Redevelopment” means any construction, alteration, removal, or improvement performed on existing impervious area at a project site where the existing land use is commercial, industrial, institutional, or multifamily residential and the existing imperviousness for the stormwater study area exceeds 40 percent.
“Redevelopment” refers to the development classification based on the percentage of existing impervious and is not interchangeable with the definition of “reconstruction”.
57. “Responsible personnel” means any foreman, superintendent, or project engineer who is in charge of site clearing and grading operations or the implementation and maintenance of an erosion/sediment control plan and who has received MDE approved Responsible Personnel Certification Training for erosion/sediment control.
58. “Retention structure” means a permanent structure, such as but not limited to a pond, that provides for the storage of runoff by means of a permanent pool of water.
59. “Retrofitting” means the construction of a BMP to provide stormwater management in a previously developed area where stormwater management was previously not provided, the modification of an existing BMP to enhance functionality, or the implementation of a nonstructural practice to improve existing water quality conditions.
60. “Same-day stabilization” means an erosion/sediment control procedure in which the work area is stabilized by the end of the work day or within a 24-hour period for around the clock construction.

61. “Sediment” means soils or other surficial materials transported or deposited by the action of wind, water, ice, gravity, or artificial means.
62. “Site” means any tract, lot, or parcel of land, or combination of tracts, lots, and parcels of land that are in single ownership or are contiguous and in diverse ownership, where development is to be performed as part of a unit, subdivision, or project. For MDOT SHA, “site” means the right-of-way.
63. “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 as described in Section 7.4.B.
64. “Stabilization” means the prevention of soil movement by covering exposed earth with erosion-resistant material including various vegetative and/or structural means. Stabilization requirements are defined as temporary and permanent and may be found in the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control*.
65. “Stable conveyance” means there is no evidence of erosion, or potential for erosion to occur, in the receiving water course.
66. “Standards and Specifications” means the *2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control* and any subsequent revisions.
67. “State unit” means any State agency that intends to or does clear, grade, transport, or otherwise disturb the land or soil surface in the course of its activities.
68. “Steep slopes” means, for the purposes of erosion/sediment control, those slopes with gradients of 20 percent or more.
69. “Stormwater” means water that originates from a precipitation event.
70. “Stormwater management” means, for:
 - a. Quantitative control, a system of measures that control the increased volume and/or rate of surface runoff caused by man-made changes to the land; and
 - b. Qualitative control, a system of measures that reduce or eliminate pollutants that might otherwise be carried by runoff.
71. “Stormwater facility” means ESD, structural, or non-structural stormwater practices that have an assigned MDOT SHA BMP number.
72. “Stormwater management system” means natural areas, ESD practices, BMPs, and any other structural or nonstructural stormwater measures through which stormwater flows, infiltrates, or filters prior to discharge from a site.

73. “Stormwater study area” means the boundary containing all areas necessary for determining the development classification for a point of investigation as outlined in the Procedures. It typically corresponds to the limit of disturbance. Development is classified as either new development or redevelopment.
74. “Variance” means the modification of the minimum stormwater management or erosion and sediment control requirements for exceptional circumstances such that strict adherence to the requirements would result in unnecessary hardship and would not fulfill the intent of these guidelines.
75. “Waiver” means the reduction of stormwater management requirements for a specific project on a case-by-case review basis.
76. “Watercourse” means any natural or artificial stream, river, creek, ditch, swale, gutter, channel, canal, conduit, culvert, drain, waterway, gully, or ravine in and including any adjacent area that is subject to inundation from overflow or flood water.
77. “Water quality volume (WQ_V)” means the volume needed to capture and treat 90 percent of the average annual runoff volume at a project site. In terms of ESD, the WQ_V represents the ESD_v for P_E = 1 inch.
78. “Watershed” means an extent of land or drainage area where surface runoff from rain, melting snow, and ice contributes to a single point.
79. “Watershed management plan” means a county or local municipality approved plan to manage specific watersheds that is acceptable to MDE.
80. “Waters of the State” includes:
 - a. Both surface and underground waters within the boundaries of the State subject to its jurisdiction, including that portion of the Atlantic Ocean within the boundaries of the State, the Chesapeake Bay and its tributaries, and all ponds, lakes, rivers, streams, storm drain systems, public ditches, tax ditches, and public drainage systems within the State, other than those designated and used to collect convey, or dispose of sanitary sewage; and
 - b. The floodplain of free-flowing water determined by MDE on the basis of the 100-year flood frequency.
81. “Wetlands” means an area having saturated soils or periodic high groundwater levels and vegetation adapted to wet conditions and periodic flooding as defined in Environmental Article, Title 5, Subtitle 9 and Title 16, Annotated Code of Maryland and COMAR 26.23.01 and 26.24.01 or by federal regulations.

3.0 APPLICABILITY

3.1 Scope

MDOT State Highway Administration shall not clear, grade, develop, or redevelop any land without implementing an approved construction plan that provides erosion/sediment control measures and stormwater management to control or manage runoff from such activities during and after construction, except as provided within this section. Measures for clearing, grading, new development and redevelopment shall be consistent with the Design Manual, the Standards and Specifications, the MDOT SHA Standards and Specifications, and the MDOT SHA Sediment and Stormwater Guidelines and Procedures, and be constructed according to the final plan approved by the MDOT SHA Plan Review Division (PRD).

3.2 Exemptions

The following are exempt from the provisions of the Guidelines:

- A. Stormwater Management:
 - 1. Agricultural land management practices;
 - 2. Any project that does not disturb over 5,000 square feet of land area.

- B. Erosion/Sediment Control:
 - 1. Agricultural land management practices and agricultural BMPs;
 - 2. Clearing or grading activities that disturb less than 5,000 square feet of land area and disturb less than 100 cubic yards of earth.

3.3 Stormwater Management Waivers

The 2007 Stormwater Management Act restricts stormwater management waivers because ESD must be implemented to the MEP. However, there will be development situations that warrant relaxing management obligations due to site specific circumstances.

- A. PRD may grant a waiver of all quality and quantity stormwater management control requirements when the applicant demonstrates to the satisfaction of PRD that the disturbed area will be returned to the existing condition and will result in no hydrologic changes. Examples include maintenance projects, landscaping projects, and underground activities involving pipelines, conduits, tunnels, sanitary sewers, and in-kind storm drain replacement/remediation.

- B. PRD may grant a waiver of the stormwater management quantity control requirements when the applicant demonstrates to the satisfaction of PRD that the cumulative effects of waivers granted previously cause no adverse impacts to the downstream watercourse, that ESD has been implemented for a minimum of one inch of rainfall (i.e. $P_E = 1$ inch), that the outfall is stable, and that:
 - 1. The POI discharges to tidally influenced receiving waters:
 - a. For direct discharges (C_{PV}^* and Q_P);

- b. For discharges within the site and with safe and stable conveyance from the POI to the tidal waters (Q_P) [see Section 4.1.A.5];
- c. For discharges into an existing closed storm drain system or lined channel that outfalls directly to tidally influenced waters and the storm drain system has:
 - i. Adequate capacity for $Q_{1\text{-year}}$ (C_{pv}^*); or
 - ii. Adequate capacity for $Q_{10\text{-year}}$ (C_{pv}^* and Q_P);

*** Projects located in the Critical Area must comply with the respective Critical Area regulations which may include treating a runoff volume inclusive of the C_{pv} .**

- 2. The POI discharges into a major waterway as identified in Table 1:
 - a. For direct releases (C_{pv} and Q_P);
 - b. For discharges within the site and with safe and stable conveyance from the POI to the main stem of the waterway (Q_P) [see Section 4.1.A.5.];
 - c. For discharges into an existing closed storm drain system or lined channel that outfalls directly to a major waterway and the storm drain system has:
 - i. Adequate capacity for $Q_{1\text{-year}}$ (C_{pv}); or
 - ii. Adequate capacity for $Q_{10\text{-year}}$ (C_{pv} and Q_P);
 - 3. Historical downstream flooding problems do not exist and management of the overbank flood protection (Q_P) volume within the watershed (see Table 2) is not required by the local jurisdiction and is stated as such in a letter provided by the local jurisdiction to MDOT SHA. C_{pv} shall be provided as required by the Design Manual.
- C. A Stormwater Management Waiver Application shall be submitted to PRD by the applicant or authorized representative and specifically indicate the appropriate waiver category. The application shall include sufficient descriptions, drawings, and other pertinent information necessary to evaluate the proposed project and confirm the applicability of the waiver request. A new Stormwater Management Waiver Application may be required in accordance with the provisions of this section when there are subsequent additions, extensions, or modifications to any portion of a project for which a waiver has already been applied. Waivers are only valid upon receipt of a written approval from PRD. A Stormwater Management Waiver Application is generally required for each eligible point of investigation (POI) and line of investigation (LOI). For projects with multiple POIs, waivers only apply to specific POIs and not the entire project. Depending on the nature of the proposed work activities or purpose, some projects will not require separate waiver applications for each point of investigation. This determination will be made by PRD. Examples of the types of projects that may not require separate waiver applications include utility, guardrail, and sidewalk projects. A copy of the Stormwater Management Waiver Application may be found in the Procedures.

The following types of projects may qualify for a Section 3.3.A waiver from SWM: pavement overlays, asphalt resurfacing, asphalt grinding, roadway and pavement patching, in-kind replacement of deteriorated impervious surfaces, replacement of

sidewalks within the same footprint for meeting other regulatory agency mandates such as ADA requirements, and replacement of impervious surfaces removed for the purpose of underground utility work.

Other projects that may qualify for a Section 3.3.A. waiver include landscaping projects and underground activities involving pipelines, conduits, culvert replacement, tunnels, sanitary sewers, and in-kind storm drain replacement or remediation. If there is no significant change in the site hydrology or hydraulic flow rates, storm drain projects may qualify for a Section 3.3.A waiver.

3.4 Variances

PRD may grant a written variance from any requirement of Section 4.0 Stormwater Management Criteria of the Guidelines or from the requirements of the Standards and Specifications if there are unique circumstances applicable such that strict adherence will result in unnecessary hardship and not fulfill the intent of the Guidelines. A written request for a variance, stating the specific variance sought, explaining the reasons for the request, and providing any evidence necessary to justify the request, shall be provided to PRD. A variance will not be granted by PRD unless and until sufficient justification, as deemed appropriate by PRD, is provided.

3.5 General Approvals

A general approval is a single approval under one PRD assigned number that extends to more than one project involving a particular type of activity or activities. The general approval requires a standard sediment control plan or plans for the activity covered. General approvals are only given to projects that qualify for Section 3.3.A waivers, and limitations are set on the size of the disturbance at each location. Examples of these types of projects include small structure repairs, culvert replacements, traffic signal replacements, and routine maintenance on SWM facilities. These contracts typically encompass multiple project sites located within different watersheds. The project site with the largest disturbance will be used to determine whether the project qualifies for a general approval.

3.6 Classification of Development

- A. **New Development.** A new development POI is classified as such by determining the existing imperviousness of the stormwater study area for the POI. If the existing imperviousness of the stormwater study area is equal to or less than 40 percent, the POI is classified as new development. This applies regardless of whether or not the drainage area to the POI includes reconstruction of existing impervious area and/or a decrease in impervious surfaces. New development POIs shall be designed in accordance with Section 4.1 Minimum Control Requirements for New Development.
- B. **Redevelopment.** A redevelopment POI has no net increase in impervious surface within the drainage area. If the existing imperviousness of the stormwater study area exceeds 40 percent and there is no net increase in impervious area, the POI is classified as redevelopment. This applies regardless of whether or not the drainage area to the POI includes new construction.

The stormwater management goal for redevelopment is to gain water quality treatment on existing developed lands while supporting initiatives to improve urban areas. All options for ESD shall be exhausted during concept design of redevelopment POIs; however, it is recognized that a wide range of site constraints may limit effective implementation of ESD. Alternative management options after compliance with the ESD to the MEP are available. Quantity management, including Cpv treatment, is not required for redevelopment POIs. Redevelopment will be designed in accordance with Section 4.2 Minimum Control Requirements for Redevelopment.

- C. **Combination of New Development and Redevelopment.** Frequently a POI has a combination of new development and redevelopment. When the study area for a POI has an existing imperviousness greater than 40 percent and a net increase in the total impervious area, the net increase portion shall be managed in accordance with Section 4.1 Minimum Control Requirements for New Development and the remaining portion shall be managed in accordance with Section 4.2 Minimum Control Requirements for Redevelopment.

4.0 STORMWATER MANAGEMENT CRITERIA

4.1 Minimum Control Requirements for New Development

Stormwater management systems shall be designed such that all reasonable opportunities for using ESD planning techniques and treatment practices from Chapter 5 of the Design Manual are exhausted, and only where absolutely necessary are structural BMPs from Chapter 3 implemented. The standard of ESD to the MEP shall be implemented for all MDOT SHA projects. Professional engineering judgment will be needed to determine whether site constraints prevent reasonable implementation of ESD.

A. The minimum control requirements are as follows:

1. The ESD standard is met when post-development hydrology is restored to natural hydrologic conditions assuring that channel stability is maintained, pre-development groundwater recharge is replicated, and nonpoint source pollution is minimized for the 1-year 24-hour frequency storm event. This requires capturing and treating from 1 inch to 2.6 inches of rainfall depending on the site conditions. Runoff from a minimum of 1 inch of rainfall must be treated using Chapter 5 ESD practices. The rainfall (P_E) above 1 inch should also be treated using ESD. Only when management of the full ESD_v using ESD practices is not practicable may Chapter 3 structural BMPs be used for treating rainfall (P_E) above 1 inch. When the entire IART is treated for the full target rainfall (P_E), thereby meeting the ESD_v storage volume requirements, the ESD requirements (including C_{pv} , WQ_v , and R_v) are completely satisfied. Management requirements shall be determined using the method outlined in the Procedures and the specific rainfall targets in Section 5.2 of the Design Manual. See the Procedures for clarifications on computing ESD_v , IART, WQ_v , R_v , and C_{pv} .
2. The IART is an integral part of meeting stormwater management quality requirements. Stormwater management plans shall incorporate a design to capture the entire IART as outlined in the Procedures.
3. Project sites may include previously approved or credited stormwater management measures, such as buffers or disconnections, or existing stormwater management facilities that provide quality and/or quantity management for existing conditions. A check shall be done to determine whether the proposed development results in a loss of existing management. If so, these losses shall be replicated in full, using current standards, by the proposed stormwater management design.
4. Refer to Table 2 to determine whether quantity control of the 2-year or 10-year 24-hour frequency storm events is required for addressing overbank flood projection volume (Q_p). When Q_p management is required, the design shall be in accordance with the Design Manual and the Procedures.
5. Stable and safe conveyance of the 10-year 24-hour frequency storm shall be

provided for all points where flow leaves the project site. Discharge velocities for the 10-year 24-hour frequency storm shall be non-erosive. The downstream impact analysis shall extend to a point downstream where the contributory drainage area is two times the drainage area to the POI or to the first downstream tributary whose drainage area equals or exceeds the contributory drainage area to the POI.

6. Management of extreme flood volume (Q_f) shall be based on requirements of the local jurisdiction in which the project is located.
 7. Projects located in designated inter-jurisdictional Flood Hazard Watersheds (Jones Falls, Gwynns Falls, and Herring Run in Baltimore City/County and Carroll Creek in Frederick City/County) are required to provide management measures necessary to maintain the post-development peak discharges for the 100-year 24-hour frequency storm event at a level that is equal to, or less than, the 100-year 24-hour pre-development peak discharge rates. The stormwater management practices in these watersheds shall control the volume, timing, and rate of flow necessary to maintain no increase in the downstream peak discharge for the 100-year 24-hour frequency storm event.
- B. PRD may require more than the minimum control requirements specified in the Guidelines when hydrologic or topographic conditions warrant, when historical downstream flooding exists, as determined by PRD or local jurisdiction, or when receiving channel degradation exists or has the potential to occur as a result of the project.
- C. If a development activity changes runoff characteristics in a manner that creates points of concentrated flow, where previously there was sheet flow, or increases discharge rates or discharge volumes for the 1-year, 2-year, and/or 10-year 24-hour frequency storms, PRD may require additional quantity management and/or written consent from the downstream property owner affected by these changes. Affected downstream property owners include owners of those properties through which the runoff will travel before entering waters of the State.
- D. PRD may institute alternate minimum control requirements. Alternative requirements may include preventative and corrective control measures for flood damage, accelerated stream erosion, water quality, and sedimentation. Comprehensive watershed studies may also be required.
- E. Where applicable, stormwater management plans shall be consistent with adopted and approved institutional management plans, watershed management plans, or flood management plans in accordance with the Flood Hazard Management Act of 1976.
- F. Additional protection measures for Tier II streams, Critical Areas, impaired waters, or waters with an established total maximum daily load (TMDL) may be required by PRD above ESD to the MEP.

4.2 Minimum Control Requirements for Redevelopment

- A. Stormwater management for redevelopment shall be in accordance with the following:
 - 1. The redevelopment design shall reduce existing impervious areas within the LOD by a minimum of 50 percent. When redevelopment reduces the existing impervious area within the LOD by 50 percent or more, water quality treatment is satisfied; or
 - 2. Alternatively, ESD shall be implemented to the MEP to provide water quality treatment for a minimum of 50 percent of the existing impervious area within the LOD. To meet stormwater management requirements for redevelopment, treatment shall be provided for the runoff from 1 inch of rainfall ($P_E = 1$ inch) for 50 percent of the redeveloped impervious area. See the Procedures for clarifications on treatment.
 - 3. When a combination of impervious area reduction and stormwater management facilities is used, the combined reduction and treated areas shall equal, or exceed, 50 percent of the existing impervious area within the LOD.
- B. Where conditions prevent impervious area reduction and/or the implementation of Chapter 5 ESD facilities, alternative management practices may be considered in accordance with Section 5.4 Alternative Stormwater Management Measures.
- C. If a redevelopment activity changes the site runoff characteristics in a manner that creates points of concentrated flow, where previously there was sheet flow, or increases discharge rates or discharge volumes for the 1-year, 2-year, and/or 10-year 24-hour frequency storms, PRD may require quantity management and/or written consent from the downstream property owner affected by these changes. Affected downstream property owners include owners of those properties through which the runoff will travel before entering waters of the State.
- D. Certain activities, such as pavement overlay and/or patching and sidewalk replacement, may be considered maintenance, subject to approval by PRD, and thereby redevelopment requirements are not applicable.

4.3 Specific Design Criteria

The design criteria, methodologies, and construction specifications for stormwater management systems are those found in the Design Manual and the Procedures. The following shall be addressed when designing a stormwater management system:

- A. Velocity dissipation devices or flow spreaders shall be placed at the outfall of all detention or retention structures, all storm drain outfalls, and along the length of any outfall channel as necessary to provide non-erosive velocities or promote sheet flow at the point of discharge.

- B. If an increase in flooding or stream channel erosion could occur at a downstream dam, highway, structure, or natural point of restricted stream flow, the designed post-development release rate of the facility shall be reduced to existing discharge rates for the 10-year storm event, and in certain watersheds, the 100-year storm event.
- C. When a structure meets the definition of a small pond as outlined by Pond Code 378 and the Procedures, the structure shall be designed in accordance with Pond Code 378 and approved by MDE pursuant to the Environmental Article, Annotated Code of Maryland, Title 5, Subtitle 5. The hazard class of the structure shall be determined by a dam breach analysis.
- D. Acceptable methods of modeling the stormwater discharge from a site are TR-55, TR-20 or other modeling software that uses the NRCS Type II Hydrograph method as approved by PRD. Model output sheets shall state that the NRCS Type II Hydrograph method is used and shall clearly show all required data and information in an organized manner.
- E. In situations where controlling the peak discharge rate has the potential to adversely impact the hydrology or hydraulics downstream of the POI, the applicant shall submit to PRD 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 due to the proposed development upon a dam, highway, structure, or natural point of restricted stream flow. The point of analysis shall be established with the concurrence of PRD and should be located either at the point downstream of the POI where the contributory drainage area is two times the contributory drainage area to the POI, or at the point downstream of the first downstream tributary whose drainage area equals or exceeds the contributing area to the POI. Based on the results of the analysis, appropriate management requirements will be determined.
- F. When the existing impervious area being reconstructed drains to an existing stormwater management BMP, this area is considered treated as previously designed. If the BMP was constructed in accordance with current regulations, no additional management is necessary for the respective area. If the BMP was not constructed in accordance with current standards, current management requirements shall apply. For those existing BMPs where management upgrades are not necessary, the applicant shall verify the BMP is functioning as designed or shall provide necessary improvements to meet current standards. If an existing BMP is retrofitted, modified, or disturbed in any way, it shall be redesigned and reconstructed to meet the current requirements for that type of facility as well as to maintain existing management levels in accordance with the Procedures. All unmanaged existing impervious areas within the LOD shall be controlled in accordance with Section 4.1 or 4.2 as applicable. Impervious area being directed to an existing BMP under proposed conditions that was not directed to the existing BMP under existing conditions shall be treated in accordance with Section 4.1.

5.0 STORMWATER MANAGEMENT MEASURES

The planning techniques, nonstructural practices, microscale practices, and design methods specified in Chapter 5 of the Design Manual and the Procedures shall be used to implement ESD to the MEP. The use of ESD planning techniques and treatment practices shall be exhausted to PRD's satisfaction before using structural BMPs from Chapter 3 of the Design Manual.

Stormwater management plans shall be designed using ESD sizing criteria for ESDv, Rev, WQv, Cpv, and IART according to the Procedures and the Design Manual. Additionally, stormwater management plans shall be designed to provide overbank flood protection (Q_p) and to prevent flood damage from large storms (Q_f).

5.1 ESD Planning Techniques

The following fundamental ESD planning techniques shall be applied according to the Design Manual to satisfy the applicable minimum control requirements established in Section 4.0 of the Guidelines:

- A. Plan the development to fit the site;
- B. Preserve and protect natural resources;
- C. Protect and avoid steep slopes and highly erodible soils;
- D. Conserve natural drainage patterns;
- E. Minimize impervious area;
- F. Use green roofs, permeable pavement, reinforced turf, and other alternative surfaces;
- G. Reduce runoff volume;
- H. Maintain 100 percent of the annual pre-development groundwater recharge volume;
- I. Cluster development;
- J. Limit soil disturbance, mass grading, and compaction; and
- K. Use other measures that promote ESD as approved by PRD

5.2 ESD Practices

The following ESD treatment practices shall be designed in accordance with the Design Manual and Procedures to satisfy the applicable minimum control requirements established in Section 4.0 of the Guidelines:

A. Alternative Surfaces:

- 1. Green roofs;

2. Permeable pavements; and
 3. Reinforced turf.
- B. Nonstructural Practices:
1. Disconnection of rooftop runoff;
 2. Disconnection of non-rooftop runoff; and
 3. Sheetflow to conservation areas.
- C. Micro-scale Practices:
1. Rainwater harvesting;
 2. Submerged gravel wetlands;
 3. Landscape infiltration;
 4. Infiltration berms;
 5. Dry wells;
 6. Micro-bioretention;
 7. Rain gardens;
 8. Grass swales;
 9. Bio-swales;
 10. Wet swales; and
 11. Other practices approved by PRD.
- D. ESD treatment practices that do not allow or promote groundwater recharge (i.e. practices with underdrains, green roofs) require additional measures to meet Rev to fully satisfy the ESDv requirement. An enhanced filter or an acceptable gravel reservoir shall be provided to satisfy Rev within a practice that contains an underdrain system. Note that the enhanced filter in Chapter 5 of the Design Manual is not a stand-alone ESD treatment practice.
- E. The use of ESD planning techniques and treatment practices specified in this section shall not conflict with existing State law, regulations, or policies.

5.3 Structural Stormwater Management Practices

- A. When the required ESDv has not been fully provided after implementing ESD to the MEP and/or quantity management is required, structural BMPs shall be designed in accordance with Chapter 3 of the Design Manual and the Procedures, to satisfy the applicable minimum control requirements established in Section 4.0 of the Guidelines. These include:
 - 1. Stormwater management ponds;
 - 2. Stormwater management wetlands;
 - 3. Stormwater management infiltration;
 - 4. Stormwater management filtering systems; and
 - 5. Stormwater management open channel systems.
- B. When required by Section 4.1 of the Guidelines, structural BMPs shall be designed to provide stormwater quantity management for Q_P management and extreme flood events.
- C. When selecting structural BMPs, the performance criteria specified in the Design Manual and the Procedures with regard to general feasibility, conveyance, pretreatment, treatment and geometry, environment and landscaping, and maintenance apply.
- D. Structural BMPs shall be selected and designed to accommodate unique hydrologic or geologic conditions, such as high groundwater and Karst topography, encountered within certain regions of the State.

5.4 Alternative Stormwater Management Measures

Where conditions prevent impervious area reduction and/or the implementation of ESD, alternative management measures may be considered subject to the discretion of PRD. Alternative planning techniques, treatment practices, innovative technologies, and structural stormwater measures may only be used for managing stormwater when they meet the performance criteria established in the Design Manual, the Procedures, and all subsequent revisions and are approved by MDE and PRD. The following order of preference shall apply:

- A. An on-site structural BMP designed in accordance with Chapter 3 of the Design Manual and the Procedures;
- B. An off-site structural BMP, designed in accordance with Chapter 3 of the Design Manual and the Procedures, located within the project watershed, included as part of the project;
- C. Retrofitting an existing BMP in the project watershed to meet current standards;
- D. Stream restoration of a stream or tributary within the project watershed; or

- E. Innovative technologies as approved by MDE.

5.5 Compensatory Stormwater Management

PRD may allow compensatory stormwater management for a specific project or portion of a project.

Compensatory management means the stormwater from an area different from the area being developed is being managed. The level, type, and location of management provided by compensatory management shall meet the requirements of Section 4.0 of the Guidelines. Additionally, compensatory stormwater management must meet the specific requirements detailed in the Procedures for one of the following categories:

- A. Compensatory stormwater management shall be provided as part of the project's stormwater management plan; or
- B. Compensatory stormwater management (i.e., the Water Quality Bank) shall be implemented in accordance with a previously approved Memorandum of Agreement (MOA) between MDE and MDOT SHA; or
- C. The compensatory stormwater management shall be consistent with any applicable watershed management plan approved by the local stormwater management authority and acceptable to MDE and PRD.

5.6 Institutional Stormwater Management Plan

MDOT SHA may develop Institutional Management Plans (IMP) for its properties such as Hanover Office Complex, District Offices, etc. When such plans are developed, they shall be approved by PRD and shall meet all the requirements for IMP as outlined in the Maryland Stormwater Management and Erosion & Sediment Control Guidelines for State and Federal Projects.

6.0 EROSION/SEDIMENT CONTROL CRITERIA

Erosion/sediment control plans, details, practices, and measures shall be designed in accordance with the Standards and Specifications and the Procedures.

6.1 Principles

Acceptable erosion/sediment control plans are designed to capture sediment on-site, mitigate on-site soil erosion, and protect against downstream erosion by preventing increases in runoff from the construction area. The following principles described in Section A of the Standards and Specifications shall be followed in developing erosion/sediment control plans that prevent erosion, protect against downstream erosion, capture sediment on-site, and meet applicable requirements:

- A. Use ESD Planning Techniques from Section 5.1 of the Guidelines;
- B. Minimize disturbed areas;
- C. Stabilize exposed soils as soon as practicable;
- D. Control and/or manage on-site and off-site runoff;
- E. Protect perimeter areas and retain sediment on-site; and
- F. Make provisions for inspecting and maintaining sediment controls.

6.2 Stabilization

Earth disturbances shall be stabilized as soon as possible and as dictated by the approved plan. At a minimum, all perimeter controls and slopes steeper than 3:1 require stabilization within three (3) calendar days of initial soil disturbance or re-disturbance, and all other disturbed areas require stabilization within seven (7) calendar days of initial soil disturbance or re-disturbance. Only areas under active grading, or on certain sites such as interior areas of surface mines and sanitary landfill cells, are exempt from these requirements. Accelerated stabilization may be required based on site characteristics or as specified by PRD. All stabilization requirements shall be indicated on the erosion/sediment control plan.

6.3 Grading

To reduce the potential for erosion, the extent and duration of soil exposure shall be minimized, and grading shall be completed and stabilized as soon as possible after it is initiated. Plans shall phase construction and earth disturbance activities to ensure that only areas under active construction are exposed.

6.4 Design Methodology

The design of erosion/sediment control must be integrated with the stormwater management plan. Specific erosion/sediment control submittal requirements for meeting ESD to the MEP include:

showing and labeling slopes steeper than 20 percent, highly erodible soils, and vegetative buffer strips on drainage area maps; including a narrative describing how erosion/sediment control will be integrated into the stormwater management strategy; and providing a detailed sequence of construction. The following steps are necessary for an erosion/sediment control plan to achieve ESD to the MEP:

- A. Identify existing drainage patterns, drainage area boundaries, and slopes (concept plan);
- B. Identify areas of special concern (concept plan);
- C. Fingerprint project. Develop site layout (concept plan);
- D. Determine phasing requirements and select initial erosion/sediment controls (site development and final plans);
- E. Identify interim drainage patterns, drainage area boundaries, and slopes; and select interim controls (site development and final plans);
- F. Identify proposed drainage patterns, drainage area boundaries, and slopes; and select final controls (site development and final plans); and
- G. Provide sequence(s) of construction (site development and final plans).

7.0 PLANS

The ESD process begins at project conception and proceeds through final approval. Plans shall be developed for the concept, site development, and final project designs. Additionally, stormwater management and erosion/sediment control strategies shall be considered together starting in the initial stages of site development. The objective is that review comments be obtained early in the approval process to promote feedback for more effective and improved erosion/sediment control and stormwater plans.

The design, review, and approval process for the three phases of project development will better ensure that all important resources have been mapped and protected and all opportunities to enhance natural areas have been explored early in project design. Impervious cover should be minimized, nonstructural practices should be used to disconnect impervious surfaces where possible, and the use of alternative surfaces should be explored. Additionally, project planning shall incorporate the erosion/sediment control design to prevent sediment contamination and constructability issues in later phases.

7.1 Plan Submission

- A. Plans shall be submitted and approval obtained for the concept, site development, and final project designs. PRD will review the stormwater management and erosion/sediment control plans and documentation in each submittal and provide the applicant with comments and/or marked plans and reports as warranted. For concept submissions, only the material required for evaluating the concept design will be reviewed. With each resubmission of the plans and documentation, the applicant shall provide a point-by-point response with substantive responses to all of PRD's comments.
- B. Proposed modifications to an approved stormwater management and/or erosion/sediment control plan shall be submitted to and approved by PRD in accordance with Section 8.1 and the Procedures.
- C. The following items are required for plan submissions at the indicated submission level:
 1. **Concept:** Include one hard copy and one PDF of the following:
 - a. Application for Sediment Control/Stormwater Management Plan Approval;
 - b. Concept Plan satisfying Section 7.4.A;
 - c. Concept Report satisfying applicable portions of Section 7.4.D;
 - d. Concept Plan submission checklist (required with initial submission only);
 - e. Signed Waiver Requests (as applicable);
 - f. Signed Variance Request Letters (as applicable); and
 - g. Signed Water Quality Summary Sheet.

Note: Certain maintenance projects may proceed from concept approval to final plan submission upon written request and concurrence from PRD.

2. **Site Development:** Include one hard copy and one PDF of the following:
 - a. Application for Sediment Control/Stormwater Management Plan Approval;
 - b. Site Development Plan satisfying Section 7.4.B;

- c. Site Development Report satisfying Section 7.4.D;
 - d. Site Development Plan submission checklist (required with initial submission only);
 - e. Signed Waiver Requests (as applicable);
 - f. Signed Variance Request Letters (as applicable); and
 - g. Signed Water Quality Summary Sheet.
3. **Final:** Include one hard copy and one PDF of the following:
- a. Application for Sediment Control/Stormwater Management Plan Approval;
 - b. Final Plan satisfying Section 7.4.E;
 - c. Final Report satisfying Section 7.4.D;
 - d. Final Plan submission checklist (required with initial submission only);
 - e. Signed Waiver Requests (as applicable);
 - f. Signed Variance Request Letters (as applicable);
 - g. Signed Water Quality Summary Sheet;
 - h. MDE approval of Code 378 small pond or hazard class structures; and
 - i. Copies of other agency approvals and permits.
4. **Modifications to Approved Plans:** Include one hard copy and one PDF of the following:
- a. Proposed plan changes; and
 - b. Supporting documentation, including the reason for the requested modification.

7.2 Preparation of Plans

- A. The stormwater management and erosion/sediment control plans shall be prepared by an individual whose qualifications are acceptable to PRD. PRD requires that stormwater management and erosion/sediment control plans be prepared, stamped, and signed by a professional engineer, professional land surveyor, or landscape architect licensed in the State of Maryland. For designs and plans prepared “in-house” by the State Highway Administration, the same is encouraged.
- B. If a Dam Safety Permit or small pond approval is required by MDE, the plans and design computations for the respective pond shall be prepared, stamped, and signed by a professional engineer licensed in the State of Maryland. For designs and plans prepared “in-house” by MDOT SHA, the same is encouraged. An MDE Pond Summary Sheet shall be completed and submitted to MDE. If small pond approval is required, the applicant shall submit plans to the Sediment and Stormwater Plan Review Division of MDE for review and approval. For significant hazard and high hazard structures, as well as ponds located in Use III Watersheds, the applicant shall submit plans to MDE Dam Safety Division for review and approval. The applicant shall submit a copy of the applicable MDE permit or approval letter to PRD. PRD will not issue final approval until MDE’s Dam Safety Permit or small pond approval is issued.

7.3 Review and Approval of Plans

- A. Stormwater management and erosion/sediment control plans are reviewed to determine compliance with the Guidelines, the Procedures, the Design Manual, the Standards and Specifications, and Pond Code 378 prior to approval. In approving the plan, PRD may

impose additional conditions that may be deemed necessary to ensure compliance with the provisions of COMAR 26.17.01, COMAR 26.17.02, COMAR 26.17.04, and the preservation of public health and safety.

- B. Concept and site development approvals expire two (2) years from the date of issuance unless extended or renewed by PRD.
- C. The final erosion/sediment control and stormwater management plan for the project is considered approved upon being stamped, dated, and signed by the PRD and with issuance of a written approval letter.
- D. Construction must be completed within three years of the final plan approval or the approval is null and void, unless an extension has been requested by the applicant, and is granted by SHA-PRD.
- E. PRD reserves the right to deny approval, re-approval, or extensions or to impose conditions necessary to prevent a nuisance or dangerous condition, sediment pollution, or adverse impacts to public safety and welfare.

7.4 Contents of Plans

The plan shall be accompanied by a report that includes sufficient information to evaluate the environmental characteristics of affected areas, the potential impacts of the proposed development on water resources, and the effectiveness and acceptability of measures proposed for managing stormwater runoff. The minimum information submitted to support the stormwater management and erosion/sediment control plans or waiver application shall be in accordance with the following:

- A. **Concept Design.** The applicant shall submit a concept plan that provides sufficient information for an initial assessment of the proposed project. The plan and report submitted for concept design approval shall include at minimum:
 - 1. A narrative that supports the concept design for both erosion/sediment control and stormwater management; describes how ESD to the MEP will be used to meet the minimum requirements; justifies any management measures not considered ESD; and addresses the overbank flood protection and extreme flood volume, if deemed appropriate;
 - 2. A plan at a minimum scale of 1 inch = 100 feet, or other as deemed necessary by PRD, showing:
 - a. Site location, property boundaries or right-of-way, topography, existing natural features, drainage patterns, bodies of water, highly erodible soils, steep slopes, wetlands, and any other sensitive resources requiring special protection during construction.
 - b. The proposed limit of disturbance, the preliminary location of all existing and proposed improvements including but not limited to buildings, roadways,

- parking areas, sidewalks, other impervious areas, alternative surfaces, existing stormwater management facilities, proposed stormwater management facilities, storm drain systems, utilities, and hot spots.
- c. Preliminary drainage area delineations to all proposed BMPs.
 - d. Aerial mapping of the area.
3. A general description of the predominant soil types on the project site, as described by the appropriate soil survey information available through the soil conservation district or from the USDA Natural Resources Conservation Service;
 4. Preliminary drainage area maps at a minimum scale of 1 inch = 100 feet, or other as deemed necessary by PRD, showing the location of all existing and proposed locations of discharge from the project site to be identified as points or lines of investigation;
 5. The identification of new points of concentrated discharge as well as overall impacts to adjacent property owners. Note that PRD may require easements or other necessary property interests concerning stormwater discharge onto adjacent properties, where deemed necessary due to increased volume or rate of discharge from the project site. 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. It is the responsibility of MDOT SHA to secure said easements or other necessary property interests prior to final plan approval. Alternatively, a right-to-discharge agreement may be signed by the affected downstream property owner(s) when an increased volume and/or rate of discharge is proposed from the project site;
 6. A preliminary drawing showing a breakdown by POI of the project site's impervious area including new construction, reconstruction, impervious areas removed (i.e. demolition), and maintenance areas. The acreage/square footage of these areas shall be estimated on the drawing;
 7. Preliminary estimates of the unified sizing criteria for each POI based on the identified stormwater study area as well as including IART, target P_E , ESDv, WQv, Cpv, Rev, and Q_P as outlined in the Procedures. Intentions to seek waivers and/or variances shall be indicated;
 8. The selection and location of alternative surfaces, non-structural ESD practices, micro-scale ESD practices, structural BMPs, and alternative management measures to be used;
 9. Identification of any additional protection measures for Tier II streams, Critical Areas, impaired waters, or waters with an established Total Maximum Daily Load (TMDL) above the required ESD to the MEP; and
 10. Other information in the Procedures and as required by PRD subsequent to the

submissions made or as described in MDOT SHA procedures shall be provided.

- B. **Site Development Design.** Following concept plan approval by PRD, the applicant shall submit a site development plan that addresses comments received during the previous review phase. Plans and reports submitted for site development approval shall be of sufficient detail to allow site development to be reviewed and shall include but are not limited to:
1. A report providing the content information listed in Section 7.4.D of these guidelines;
 2. A plan overlaying the types and locations of sediment control and stormwater management practices to be used;
 3. Construction plans containing the content information listed in Section 7.4.E of these guidelines;
 4. Any information required for the Final Plan that the applicant elects to include as part of the Site Development Plan; and
 5. Other information in the Procedures and as required by PRD subsequent to the submissions made or as described in the Procedures shall be provided.
- C. **Final Design.** Following site development approval by PRD, the applicant shall submit final erosion/sediment control and stormwater management plans that address the comments received during the previous review phase. Plans and reports submitted for final approval shall be of sufficient detail to allow all approvals and permits to be issued in accordance with the following:
1. The final stormwater management and erosion/sediment control plans shall be submitted for approval in the form of construction drawings accompanied by a copy of a report. The plans and report shall include the sufficient information to evaluate the effectiveness of the proposed runoff control design as listed in Sections 7.4.D and 7.4.E of these guidelines;
 2. When applicable, Stormwater Management Waiver Applications, indicating the appropriate waiver category, shall be signed and submitted for each POI for which a waiver is being requested;
 3. When a variance has been sought, a formal letter explaining the variance being requested and providing the justified basis for the variance shall be prepared and signed by the owner/developer;
 4. When deemed necessary, an easement shall be secured or a right-to-discharge agreement shall be signed by the affected downstream property owner(s) when an increased volume and/or rate of discharge is proposed from the project site;

5. The Design Certification shall be signed and dated;
 6. The Owner/Developer Certification shall be included on the title sheet adjacent to the signature block;
 7. When applicable, Pond Summary Sheets shall be signed and dated by the professional engineer certifying the design; and
 8. Other information as listed in the Procedures or as required by PRD shall be provided.
- D. **Report.** A stormwater management and erosion/sediment control report shall be submitted for concept, site development, and final plan approval in accordance with the following:
1. The report shall be on 8 1/2" x 11" paper and bound in a 3-ring binder. The report shall be typed, however certain computational sheets may be handwritten. Any maps, diagrams, or figures that are larger than 8 1/2" x 11" shall be folded to a size of 8 1/2" x 11" or smaller and placed within the report. All maps, diagrams, or figures shall be clearly labeled and legible. All pages, including appendices, shall be numbered.
 2. The report shall be formatted as follows:
 - a. Cover sheet with applicant's name, project title, date, PRD number, and name and address of designer;
 - b. Table of contents;
 - c. List of figures or tables;
 - d. Introduction;
 - e. Methodologies used;
 - f. A narrative supporting the stormwater management and sediment control designs;
 - g. Summary and conclusions of stormwater management analysis;
 - h. Stormwater management analysis;
 - i. Erosion/sediment control analysis; and
 - j. Appendices with all the background information and supporting documentation used in the erosion/sediment control design, stormwater management analysis, and, when applicable, pond design. The background

information shall be sufficient to facilitate a straightforward review.

3. At a minimum, each report shall contain the following:
 - a. An updated narrative that supports the final design for both erosion/sediment control and stormwater management; describes how ESD to the MEP will be used to meet the minimum requirements; justifies any management measures not considered ESD; and addresses the overbank flood protection and extreme flood volume, if deemed appropriate;
 - b. A final drawing showing a breakdown of the site's impervious area including new construction, reconstruction, impervious areas removed (i.e. demolition), and maintenance areas. The acreage/square footage of these areas shall be quantified on the drawing;
 - c. Stormwater management drainage area maps, at a minimum scale of 1 inch = 100 feet, or other as deemed necessary by PRD, depicting both pre-development and post-development conditions. The drainage area maps shall delineate drainage area boundaries and show acreage to all stormwater management practices and to all points of discharge from the site. Maps will include soil types, ground cover, land uses, point(s) of investigation, line(s) of investigation, and time of concentration (tc) flow paths;
 - d. Pre-development photographs of the overall site and each point of investigation clearly labeled on a location map. Photographs shall be labeled to match the map, include point of investigation numbers and direction of view, and show upstream and downstream views;
 - e. A final assessment and summary table(s) of unified sizing criteria requirements for each point of investigation as well as and including IART, target PE, ESDV, WQV, CpV, ReV, and QP compared with stormwater management provided by all the ESD practices, BMPs, and alternative management measures in the respective point of investigation;
 - f. Hydrologic computations for all ESD practices, BMPs, and alternative management measures in accordance with the Design Manual and the Procedures;
 - g. TR-55 work sheets including computations for drainage, runoff curve number and time of concentration;
 - h. Hydraulic computations for all ESD practices, BMPs, and alternative management measures including those used to develop elevation-discharge-storage tables;

- i. TR-20 analysis including schematic diagrams showing reach lengths, curve numbers, drainage areas, and structure locations, and clearly labeled printouts giving input data, output data and hydrographs;
 - j. All spillway computations;
 - k. Results from geotechnical investigations including boring logs and locations, site specific recommendations, and any additional information necessary for the final stormwater management design;
 - l. Where deemed necessary by PRD, an analysis of the impacts of stormwater flows downstream in the watershed. The analysis shall include photographs as well as hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing and flow rate modifications resulting from the proposed development upon a dam, highway, structure, or natural point of restricted stream flow, established with the concurrence of PRD, and shall extend downstream:
 - i. To the first downstream tributary whose drainage area equals or exceeds the contributing area to the BMP; or
 - ii. To the downstream point where the contributing drainage area is two times the contributing drainage area at the point of investigation.
 - m. Signed, completed Stormwater Management Waiver Applications for each POI as appropriate (see Procedures);
 - n. Signed variance request letter(s) and supporting documentation as appropriate;
 - o. Signed, completed Water Quality Summary Sheets as appropriate (see Procedures);
 - p. Pond Summary Sheets and dam breach analyses as appropriate for Code 378 small ponds (see Procedures);
 - q. Erosion/sediment control computations and supporting documentation;
 - r. Any non-standard erosion/sediment control specifications; and
 - s. Other information specified in the Procedures or otherwise required by PRD.
- E. Construction Plans.** At a minimum, drawings submitted for site development and final plan approval shall include:

1. MDOT SHA project name and the designer (all sheets);
2. Title Sheet;
3. An index of plan sheets;
4. PRD project number;
5. Date and subsequent revision dates (all sheets);
6. Certification by the owner or developer (see Procedures) that any clearing, grading, construction, or development will be done pursuant to the approved plan and that responsible personnel involved in the construction project will have a Certificate of Training at an MDE approved training program for the control of erosion/sediment prior to beginning the project. Additionally, the owner or developer shall certify right of entry for periodic on-site evaluation by State of Maryland, Department of the Environment, Compliance Inspectors;
7. Certification by the designer (see Procedures) that the plans have been designed in accordance with appropriate approved stormwater management and sediment control regulations and standards. The certification shall be completed and signed on final plan.
8. Professional Certification, seal, and signature by a Professional Engineer licensed in the State of Maryland on projects involving Code 378 Ponds or when deemed appropriate by PRD;
9. Standard Stabilization Note stating, “Following initial soil disturbance or disturbance, permanent or temporary stabilization shall be completed within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) days as to all other disturbed or graded areas on the project site not under active grading.”;
10. A vicinity map (title sheet);
11. A location map (title sheet);
12. North arrow (all plan sheets and drainage area maps);
13. Horizontal/vertical datum used;
14. Minimum scale of 1 inch = 50 feet, or other as deemed necessary by PRD;
15. A legend including standard symbols for sediment controls and other relevant content;

16. A plan note to contractor stating: "Note to Contractor: Erosion/sediment control will be strictly enforced" (all E&SC plans);
17. Existing site characteristics including but not limited to:
 - a. A topographic survey, showing all existing contours at a minimum of 2 foot intervals, and extending a minimum of 200 feet downstream of the outfalls or to the next conveyance system, or other as deemed necessary by PRD;
 - b. All easements, rights-of-entry, rights-of-way, and property lines;
 - c. All existing features including, but not limited to, watercourses, impoundments, wooded areas, structures, hot spots, and utilities;
 - d. Delineation, if applicable, of the 100-year floodplain, any wetlands, and waters of the State within or adjacent to the project that receive runoff from the project site; and
 - e. All existing stormwater management BMPs and ESD practices including buffers, disconnections, conservation areas, etc.
18. Proposed site improvements including but not limited to:
 - a. Contours for proposed grading at a minimum of 2-foot intervals, or other as deemed necessary by PRD;
 - b. New or proposed changes to easements, rights-of-entry, rights-of-way, and property lines;
 - c. Site layout showing all proposed improvements including the location of buildings and other structures, roads and other impervious surfaces, hot spots, utilities, and storm drain systems;
 - d. Stormwater management practices including alternative surfaces, disconnections, conservation areas, ESD practices, and structural BMPs;
 - e. Profiles for all components of the proposed drainage system(s) and stormwater management facilities, including the hydraulic grade lines as well as velocities (V_{10}) and discharge flow rates (Q_{10}) from all stormwater management facilities and outfalls;
 - f. Construction details including representative sections for all components of the proposed drainage system and stormwater management facilities including appurtenances, drawn to scale unless a typical detail is provided with a table of values to address multiple uses of the detail. The typical detail shall be drawn to be proportionately correct;

- g. All necessary construction and material specifications including, but not limited to, those from Maryland Pond Code 378 and pertinent tables from Appendix B of the Design Manual; and
 - h. Permanent maintenance access to all stormwater management facilities.
19. Erosion/sediment control measures to minimize on-site erosion and prevent off-site sedimentation including:
- a. Limit of disturbance delineated using the standard LOD symbol;
 - b. Limit of grading (as applicable);
 - c. Phased sediment control plans as appropriate for transitioning from one project segment to another (horizontal phasing);
 - d. Phased sediment control plans as appropriate for depicting significant changes between initial, interim, and final conditions during grading operations (vertical phasing);
 - e. A minimum of one stabilized construction entrance for site ingress into and egress out of site;
 - f. When applicable, a designated staging/stockpile area with appropriate sediment controls;
 - g. Location and type of all proposed sediment control devices shown using the standard symbols and drawn to scale when appropriate. All disturbed areas shall drain to a sediment control device during all phases of construction, and all proposed controls shall meet the design criteria established in the E&SC Standards and Specifications;
 - h. Erosion/sediment control drainage area maps, at a minimum scale of 1 inch = 100 feet, or other as deemed necessary by PRD. Both pre-development and post-development phases shall be depicted, either together or on separate maps. Additional interim phases shall be shown, as applicable. All erosion/sediment controls applicable to the respective phase of construction shall be shown clearly on the drainage area map(s). The drainage area boundaries shall be delineated and the acreage to each erosion/sediment control stated, as applicable;
 - i. Velocities (V_{10}) and flow rates (Q_{10}) at all points of concentrated discharge for initial, interim, and final conditions;
 - j. Temporary maintenance access to all sediment control practices;

- k. Pertinent MDOT SHA and MDE standard details from the Standards and Specifications and the Procedures for all proposed standard sediment control measures;
 - l. Design details drawn to scale and specifications for sediment control measures not found in the Standards and Specifications; and
 - m. Provisions to salvage and reuse topsoil.
20. A sequence of construction that addresses the implementation of both sediment control and stormwater management and at a minimum includes the following steps, in correct order, and considers phasing:
- a. Notification of MDOT SHA's Erosion and Sediment Control Quality Assurance (MDOT SHA QA) Program at 410-365-0164 a minimum of seven (7) days in advance of any earth disturbance activity to schedule a pre-construction meeting;
 - b. Clearing and grubbing as necessary for the installation of perimeter controls;
 - c. Construction and stabilization of perimeter controls;
 - d. Remaining clearing and grubbing within installed perimeter controls;
 - e. Installation of interior sediment control measures;
 - f. Road grading;
 - g. Grading for the remainder of the site;
 - h. Utility installation and connections to existing structures;
 - i. Construction of buildings, roads, and other features;
 - j. Final grading, landscaping, and stabilization;
 - k. Progression to a subsequent phase of construction;
 - l. Installation of stormwater management measures;
 - m. Approval of MDOT SHA QA Program prior to removal of sediment controls;
 - n. Removal of controls and stabilization of areas that are disturbed by removal of sediment controls; and

- o. Final site survey and as-built submission in accordance with MDOT SHA as-built directive.
21. Standard Erosion and Sediment Control Notes (see Procedures) including the following site information:
 - a. Total site area;
 - b. Total disturbed area;
 - c. Area to be roofed and/or paved (includes new construction and reconstruction);
 - d. Total volume of spoil material (cut);
 - e. Total volume of borrow material (fill); and
 - f. Off-site waste/borrow area location (if known).
22. Vegetative Stabilization Specifications from Section B-4 of the E&SC Standards and Specifications as well as temporary and permanent stabilization tables listing selected seed mixes for the correct hardiness zone (see Procedures);
23. A planting plan and schedule for the stormwater management facilities that meet the requirements of the Design Manual and are appropriate for the type of proposed facilities;
24. A maintenance schedule for each type of BMP (see Procedures);
25. An As-Built Certification with signature block for execution after project completion;
26. Appropriate As-Built Schedule(s) for all BMPs; and
27. Any additional protection measures or information as required by PRD or the Procedures.

8.0 AFTER PLAN APPROVAL

8.1 Prior To and During Construction

- A. The applicant or responsible party shall notify the MDOT SHA QA Program at least seven (7) days before commencing any work in conjunction with the approved erosion/sediment control and stormwater management plans.
- B. The applicant or responsible party shall request that the MDOT SHA QA Program approve the work in accordance with the approved erosion/sediment control plan:
 1. Upon completion of installation of perimeter erosion/sediment controls;
 2. Upon establishment of permanent stabilization and prior to removal of erosion/sediment control measures.
- C. A copy of the stamped approved plan with any approved modifications and approval letters shall be available at the construction site for reference during the construction period.
- D. The Standards and Specifications shall be available on the project site at all times.
- E. For each ESD practice or other BMP, regular inspections shall be performed by the MDOT SHA construction staff and contractor as-built certifier and documented at the stages of construction specified in the Procedures, or as required by PRD. Oversight inspection of SWM construction progress and as-built checks shall be performed by MDOT SHA Quality Assurance (QA) Program. Additionally, all ESD practices and other BMPs shall be inspected upon completion of final grading and upon the establishment of permanent stabilization by the MDOT SHA's Stormwater Management Asset Manager or MDOT SHA Landscape Operations or MDOT SHA maintenance.
- F. Proposed modifications to an approved stormwater and/or sediment control plan shall be submitted to and approved in writing through the MDOT SHA QA Program/HHD/PRD review process. A request for modification shall be accompanied by a completed transmittal form and shall include the following at a minimum: the reason for and a description of the proposed change; plan sheet(s) showing the proposed changes using color and/or 'clouded areas'; and a copy of the originally approved affected plan sheet(s), showing the PRD approval stamp. Minor modifications may be reviewed and approved by the MDOT SHA QA Program or the MDOT SHA Highway Hydraulics Division in accordance with Section 1.5 of the Procedures and accompanying Administrative Appendices.
- G. Proposed modification to a Code 378 small pond or a hazard class dam structure shall be submitted to and approved by MDE in writing.

8.2 Inspection Requirements for As-Built Certification

- A. Regular inspections shall be made and documented during and after completion of construction for the following practices using the checklists provided in the Procedures:
1. Alternative surfaces:
 - a. Permeable pavers;
 - b. Green roofs;
 2. Nonstructural ESD practices:
 - a. Disconnection of rooftop runoff;
 - b. Disconnection of non-rooftop runoff; and
 - c. Sheetflow to conservation areas;
 3. Micro-scale ESD practices:
 - a. Rainwater harvesting;
 - b. Submerged gravel wetlands;
 - c. Landscape infiltration;
 - d. Infiltration berms;
 - e. Dry wells;
 - f. Micro-bioretention;
 - g. Rain gardens;
 - h. Bio-swales;
 3. Stormwater ponds;
 4. Stormwater wetlands;
 5. Stormwater infiltration;
 6. Stormwater filtering systems including bioretention;
 7. Open channel systems; and

8. Innovative technologies as approved by PRD.

8.3 Post Construction

- A. Once construction of a stormwater facility is complete, as-built plans certified by a professional engineer, a professional land surveyor, or landscape architect licensed in the State of Maryland shall be submitted in accordance with MDOT SHA as-built submission procedures and specifications to ensure that constructed stormwater management practices and conveyance systems comply with the approved plans. For a project to be closed out by the MDOT SHA QA Program, as-built acceptance is required from PRD. The As-Built Certification, As-Built Data Schedules, and submission requirements can be found in the Procedures.
- B. The intended function of any BMP constructed in accordance with an approved plan shall not be altered after construction without approval from PRD.
- C. Upon acceptance of the as-built by PRD, a Notice of Construction Completion Form (NOCC) will be submitted by PRD to MDE Science Services Administration.
- D. The responsible party in charge of construction will notify MDOT SHA QA Program upon completion of the project.
- E. MDOT SHA QA Program will submit Notice of Termination (NOT) to MDE Compliance Program and notify PRD.

9.0 COMPLIANCE

- A. As the authorized inspection agency, MDOT SHA-QA and PRD have the right to enter the project site periodically to inspect for compliance with the approved plan.
- B. MDOT SHA-QA Program will accept and investigate complaints concerning sediment control and stormwater from any interested parties.
- C. MDOT SHA-QA Program will take compliance action when erosion & sediment control and stormwater management violations of contract documents occur.
- D. MDOT SHA-QA Program will stop work on a site where land disturbance is occurring without an approved erosion/sediment control plan. Measures shall be required to be implemented to prevent off-site sedimentation.

10.0 MAINTENANCE

- A. MDOT SHA or any other person or agent in control of the approved activity for which work has been done pursuant to these guidelines shall maintain in good condition and promptly repair and restore all graded surfaces, walls, drains, dams and structures, vegetation, erosion/sediment control measures, and other protective devices. Such repairs or restoration and maintenance shall be in accordance with the PRD approved plans.
- B. A maintenance schedule shall be implemented for all MDOT SHA stormwater management facilities and shall state the maintenance to be completed, the time period for completion, and who shall perform the maintenance. Refer to the Maryland State Highway Administration Stormwater National Pollution Discharge Elimination System (NPDES) Program Standard Procedures Manual for minimum maintenance schedule requirements for all of MDOT SHA's SWM facilities.

11.0 ADDITIONAL APPROVALS

It is the responsibility of the applicant to ensure all required approvals and permits for the project beyond stormwater management and erosion/sediment control, are obtained prior to earth disturbance. Additional approvals that may be required include, but are not limited to, the following:

- A. National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activity;
- B. U.S. Army Corps of Engineers (COE) Wetlands and Waterways permits
- C. MDE Non-Tidal Wetlands and Waterways permit;
- D. Maryland Tidal Wetlands License or permit (MDE or Board of Public Works);
- E. Chesapeake Bay Critical Area Commission Approval;
- F. Code 378 small pond approval from MDE
- G. MDE Dam Safety Permit;
- H. NPDES Industrial Discharge Permit for Stormwater;
- I. Roadside Tree, Forestation and Reforestation Permit or Approvals; and
- J. Anne Arundel Soil Conservation District Approval for projects located in the Severn River Watershed.

12.0 TABLES

TABLE 1

For the purposes of Section 3.3.B.2 of the Guidelines, the following are considered major waterways:

| WATERWAY | LIMITS |
|--------------------|---|
| Susquehanna River | main stem from tidal breakpoint to Pennsylvania line* |
| Pocomoke River | main stem from tidal breakpoint to MD 12* |
| Potomac River | main stem from tidal breakpoint to I-81* |
| Youghiogheny River | main stem from Pennsylvania line to I-68 |

*Tidal reaches qualify for direct discharge waiver.

TABLE 2 (rev. 02/22/16)

For the purposes of Sections 3.3.B.4 and 4.1.A of the Guidelines, the following are minimum county flood control requirements:

| COUNTY | Q _{2-YR} | Q _{10-YR} | Q _{100-YR} |
|-----------------|-------------------|--------------------|--|
| Allegany | NO | (2) | |
| Anne Arundel | NO | (2) | (2) |
| Baltimore City | NO | YES | Jones Falls, Gwynns Falls, Herring Run |
| Baltimore | (2) | (2) | Jones Falls, Gwynns Falls, Herring Run |
| Calvert | (2) | (2) | |
| Caroline | (2) | (2) | |
| Carroll | (2) | (2) | |
| Cecil | (1) | (1) | |
| Charles | NO | YES | |
| Dorchester | YES | YES | |
| Frederick | NO | YES | Carroll Creek |
| Garrett | (2) | (2) | |
| Harford | NO | YES | |
| Howard | NO | YES | |
| Kent | NO | (2) | |
| Montgomery | NO | (2) | (2) |
| Prince George's | NO | (2) | (2) |
| Queen Anne's | (2) | (2) | |
| St. Mary's | NO | YES | YES |
| Somerset | YES | YES | |
| Talbot | (3) | NO | |
| Washington | NO | YES | (2) |
| Wicomico | (2) | (2) | |
| Worcester | YES | YES | |

Note: As a routine part of the MDOT SHA project development process, milestone submissions should be made to the county in which the project is located. Any comments received from the county concerning stormwater management or erosion and sediment control should be included in the PRD submission package.

(1) Q_{P2} is required for the Coastal Plain (south of Chesapeake & Delaware Canal), and Q_{P10} is required for the Piedmont (north of Chesapeake & Delaware Canal).

(2) Quantity control may be required by the county due to historical flooding problems, downstream floodplain development, inadequate conveyance system, or other county specific criteria. Review the applicable county ordinance for further information.

(3) Quantity control must be provided so post-developed peak is within 10% of pre-developed peak.