

5.0 Performance Criteria for Post Construction Stormwater Management

- 5.1 ~~The Technical Document may be utilized as a reference for the design and preparation of~~ Post construction stormwater management plans shall be designed in accordance with the following: ~~Alternative measures that provide functional equivalency may be considered on a case-by-case basis in accordance with Section 1.14 of these Regulations.~~
- 5.1.1 Stormwater management designs shall reduce runoff, mimic natural watershed hydrologic processes, and cause no adverse impact to property. This shall be accomplished by treating runoff at the source, disconnecting impervious surfaces, preserving or enhancing natural flow paths and vegetative cover, conserving or enhancing natural open spaces and riparian areas, and other measures that simulate natural watershed hydrologic processes.
- 5.1.2 Land disturbance including but not limited to ~~R~~residential, commercial, institutional, agricultural structures, or industrial developments shall apply these stormwater management criteria to land development as a whole. Smaller sites, such as individual residential lots in new subdivisions that are part of a larger, common plan of development or sale shall be subject to these requirements as part of that larger plan.
- 5.1.3 No portion of a stormwater system that is owned and maintained by a joint ownership such as a homeowner's association or maintenance corporation in a residential development shall be located on private property, except for those areas designated as common areas, community open space, community-owned property, jointly owned property. Shared facilities located on private property shall be within a recorded easement or within a recorded easement dedicated to public use. ~~—~~ A stormwater system owned by a single Owner, as in the case of a commercial, institutional or industrial development, may be located on that Owner's private property.
- 5.1.4 If runoff from a land development will flow to a permitted or non-permitted municipal separate storm sewer system (MS4) or other publicly maintained drainage infrastructure, the land development applicant shall notify the system's owner of the intent to discharge into the system before plan approval. The Department, Delegated Agency, or system's owner may require the land development applicant to demonstrate that the system has adequate conveyance.
- 5.1.5 All applications that propose to use infiltration or natural recharge shall include a soils investigation in accordance with Section 12.1 of these regulations to determine the appropriate design criteria.
- 5.1.6 Water quality and water quantity management shall be provided in accordance with the requirements set forth in this section unless the proposed project is limited to reconstruction of existing paved areas, re-grading and replacement of existing pervious areas, or rebuilding or repairing of structures damaged by fire, flood, wind, or other natural disaster and where the disturbed area will return to the original hydrologic condition and land cover at the conclusion of the project.
- 5.1.7 Post construction stormwater management BMPs shall meet the following requirements:
- 5.1.7.1 Post construction stormwater management BMPs shall be designed and constructed in accordance with all applicable subsections of Section 11 and Section 12 of these regulations.
- 5.1.7.2 A single BMP may require compliance with more than one subsection of Section 11 based upon its function and design.
- 5.2 Resource Protection Event Criteria
- 5.2.1 The Resource Protection Event criteria provide runoff management measures to reduce the volume of stormwater runoff generated on a site, recharge groundwater,

minimize impacts to downstream channels from runoff leaving the site, and reduce pollutant loads discharged into receiving waters.

5.2.2 The Resource Protection Event Volume (RPv) is the post-development annualized volume of runoff produced by the storm having a ninety-nine percent (99%) probability of occurrence, or the 1-year, 24-hour rainfall event. It is equal to the runoff volume generated by a 2.7" storm event.

5.2.3 Compliance with this section shall be accomplished to the maximum extent practicable through the following provisions:

~~5.2.3.1~~ Runoff from disturbed areas that were wooded or meadow in the pre-developed condition shall be reduced using runoff reduction practices to an equivalent wooded condition. Treatment of runoff from the RPv event with Best Management Practices (BMPs) as set forth in the Post-Construction Stormwater Management BMP Standards and Specifications shall meet the following requirements:

~~5.2.3.1.1~~ For forested areas within the site Limit of Disturbance (LOD), the treatment volume shall be the difference in the post-developed condition and an equivalent wooded condition, up to a maximum of 1" of runoff.

~~5.2.3.1.2~~ For non-forested areas within the site LOD, the treatment volume shall be the difference in the post-developed condition and an equivalent grassed open space condition, up to a maximum of 1" of runoff.

~~5.2.3.1.3~~ The treatment volume for existing impervious areas within the site LOD shall meet the requirements for redevelopment in accordance with Section 5.6 of these regulations.

~~5.2.3.1.4~~ BMPs that treat more than 1" of runoff may be used to over-manage LOD subareas within a site that are untreated or partially treated.

~~5.2.3.1.4~~ ~~5.2.3.1.5~~ Any additional runoff volume treated by BMPs in excess of that necessary to achieve site compliance in accordance with this section may be used as a credit in accordance with Section 13 Offset Provisions.

~~5.2.3.2~~ If additional measures are necessary to manage the remainder of runoff from the RPv to achieve the pre-development runoff rate from the RPv, then additional BMPs shall be utilized to achieve the pre-development runoff rate. All remaining disturbed areas shall employ runoff reduction practices to achieve an equivalent 0% effective imperviousness. For those cases in which the minimum runoff reduction requirements are not met:

~~5.2.3.2.1~~ The allowable discharge for any remaining runoff shall not exceed the equivalent 24-hr detention time of the RPv, and

~~5.2.3.2.2~~ An offset shall be provided for the portion of the RPv that does not meet the minimum runoff reduction requirements.

~~5.2.3.3~~ An offset shall be provided in accordance with Section 13 of these regulations for any portion of the RPv that does not meet the requirements of 5.2.3.1 above. Additional water quality treatment BMPs may be provided if the runoff reduction requirements of this section are not sufficient to meet Total Maximum Daily Load (TMDL) requirements for the receiving water. Pollutant reductions achieved through the use of these treatment BMPs may be used to partially reduce a runoff reduction offset requirement provided in accordance with Section 5.2.3.2.2 above.

5.2.4 Projects that qualify for and meet standard plan criteria ~~developed by the Department~~ in accordance with Section 3.7 of these regulations shall be considered in compliance with the Resource Protection Event criteria.

5.3 Conveyance Event Criteria

5.3.1 The Conveyance Event criteria provide runoff management measures to minimize

impacts to downstream properties, channels, and structures by optimizing watershed conveyance and hydrograph timing.

5.3.2 The Conveyance Event Volume (Cv) is the volume of runoff produced by the post-development storm having a ten percent (10%) annual probability of occurrence, or the 10-year, 24-hour rainfall event, ~~less any volume reduction achieved for the RPv in accordance with Section 5.2.~~

5.3.3 Compliance with this section shall be accomplished through the following provisions:

~~5.3.3.1~~ 5.3.3.1 The Cv shall be ~~reduced to the maximum extent practicable using runoff reduction practices. For any portion of the Cv that is not reduced, quantity management shall be provided using either a standards-based or performance-based approach~~ managed using BMPs as set forth in the Post-Construction Stormwater Management BMP Standards and Specifications such that there is no adverse impact by limiting the increase in the downstream post-developed water surface elevation to no more than 0.05 feet; or

~~5.3.3.15~~ 5.3.3.2 Improve the existing downstream conveyance system to the point where the downstream condition meets the “no adverse impact” criteria of Section 5.3.3.1; but no farther than the point where the LOD is less than 10% of the contributing drainage area; or

~~5.3.3.25~~ 5.3.3.3 Provisions will be made or exist for a non-erosive conveyance system to tidal waters by either a closed drainage system or by open channel flow that has adequate conveyance for the Cv; or

5.3.3.4 Demonstration that the location of a project within a watershed would aggravate flooding or channel erosion by the imposition of peak control requirements, as evidenced by a downstream analysis approved by the Department or Delegated Agency that shows the inflection point of the site hydrograph occurs prior to and is less than the peak of the upstream hydrograph; or

~~5.3.3.35~~ 5.3.3.5 The site LOD comprises 10% or less of the total upstream contributing drainage area at the point of discharge for sites that discharge directly to a natural stream, waterbody, or tax ditch; or

~~5.3.3.45~~ 5.3.3.6 The proposed project will generate only a de minimis discharge and will have no adverse impact on the receiving wetland, watercourse or downstream property as determined on a case-by-case basis.

5.3.4 Projects that qualify for and meet standard plan criteria in accordance with Section 3.7 of these regulations ~~developed by the Department~~ shall be considered in compliance with the Conveyance Event criteria.

5.4 Flooding Event Criteria

5.4.1 The Flooding Event Criteria provide runoff management measures to reduce downstream flooding by optimizing watershed storage and hydrograph timing.

5.4.2 The Flooding Event Volume (Fv) is the volume of runoff produced by the post-development storm having a one percent (1%) probability of occurrence, or the 100-year, 24-hour rainfall event ~~less any volume reduction achieved for the RPv and Cv in accordance with Sections 5.2 and 5.3.~~

5.4.3 Compliance with this section shall be accomplished through the following provisions:

5.4.3.1 The Fv shall be managed using BMPs as set forth in the Post-Construction Stormwater Management BMP Standards and Specifications ~~reduced to the maximum extent practicable using runoff reduction practices. For any portion of the Fv that is not reduced, quantity management shall be provided using either a standards-based or performance-based approach~~ such that there is no adverse impact by limiting the increase in the downstream post-developed

water surface elevation to no more than 0.05 feet; or

~~5.4.3.15.4.3.2~~ Improve the existing downstream conveyance system so that the downstream condition meets the “no adverse impact” criteria of Section 5.4.3.1; or

~~5.4.3.25.4.3.3~~ Provisions will be made or exist for a non-erosive conveyance system to tidal waters by either a closed drainage system or by open channel flow that has adequate conveyance for the Fv; or

~~5.4.3.4~~ Demonstration that the location of a project within a watershed would aggravate downstream flooding or channel erosion by the imposition of peak control requirements, as evidenced by a downstream analysis approved by the Department or Delegated Agency that shows the inflection point of the site hydrograph occurs prior to the peak of the upstream hydrograph; or

~~5.4.4~~ The site LOD comprises 10% or less of the total upstream contributing drainage area at the point of discharge for sites that discharge directly to a natural stream, waterbody, or tax ditch; or

~~5.4.3.5~~ The proposed project will generate only a de minimis discharge and will have no adverse impact on the receiving wetland, watercourse, or downstream property as determined on a case-by-case basis.

~~5.4.4.15.4.3.6~~ The proposed project will generate only a de minimis discharge and will have no adverse impact on the receiving wetland, watercourse, or downstream property as determined on a case-by-case basis.

~~5.4.55.4.4~~ Projects that qualify for and meet standard plan criteria in accordance with Section 3.7 of these regulations developed by the Department shall be considered in compliance with the Flooding Event criteria.

5.5 Alternative Criteria

5.5.1 Land development that discharges to State Waters included in a Designated Watershed, or other watershed management plan approved in accordance with these Regulations, shall meet the alternative criteria identified in the approved watershed plan.

~~5.5.2~~ The Department or Delegated Agency, at its discretion, may require alternative stormwater treatment practices or criteria if a receiving waterbody has been identified as impaired, or designated with a specific pollutant reduction target necessary to meet State of Delaware water quality regulations. Such requirements shall be adopted in accordance with Title 29.

~~5.5.3~~ The Department or Delegated Agency, at its discretion may require alternative stormwater treatment practices designed to reduce pollutant loading from a specific source, including but not limited to the discharge from an industrial site regulated under the National Pollutant Discharge Elimination System (NPDES).

5.6 Redevelopment Criteria

5.6.1 The Department recognizes the benefits of redevelopment. The requirements under this section are intended to encourage redevelopment while establishing compliance criteria that meet the overall goals and intent of these regulations.

~~5.6.2~~ In the case of development of a contaminated site or Brownfield site, a remediation plan approved by the Department may meet the stormwater management goals and the intent of these regulations with prior consent and subsequent approval by the Department.

5.6.2 Compliance with the Resource Protection Event as defined in 5.2.2 shall be accomplished to the maximum extent practicable for redevelopment projects through the following provisions:

5.6.2.1 In the case of redevelopment of a contaminated or Brownfield site, a

- remediation plan approved by the Department may meet the stormwater management goals and the intent of these regulations with prior consent and subsequent approval by the Department or Delegated Agency.
- 5.6.2.2 Redevelopment resulting in less than one acre of disturbed area shall adhere to Section 3.7 of these Regulations. Projects that cannot adhere to Section 3.7 shall comply with the applicable sections of 5.6.2.
- 5.6.2.3 Redevelopment on sites with stormwater management systems designed and functioning in accordance with the Delaware Sediment and Stormwater Regulations first promulgated on January 23, 1991:
- 5.6.2.3.1 Redevelopment resulting in a reduction of impervious surface where no known drainage issues exist or will be created and there are no outstanding stormwater-related maintenance issues to be resolved or addressed shall be considered in compliance with these Regulations.
- 5.6.2.3.2 Redevelopment resulting in an increase in impervious surface where no known drainage issues exist or will be created shall employ treatment or runoff reduction practices to achieve an equivalent open space in good condition for the increased impervious surface.
- 5.6.2.4 Redevelopment on sites without stormwater management systems designed and functioning in accordance with the Delaware Sediment and Stormwater Regulations first promulgated on January 23, 1991:
- 5.6.2.4.1 Redevelopment resulting in a reduction of 15% or greater in impervious surface shall be considered in compliance with these Regulations.
- 5.6.2.4.2 Redevelopment resulting in a reduction of less than 15% impervious surface where no known drainage issues exist or will be created shall employ treatment or runoff reduction practices to achieve an equivalent 15% reduction in effective imperviousness.
- 5.6.2.4.3 Redevelopment resulting in an increase in impervious surface shall employ treatment or runoff reduction practices to achieve an equivalent 15% reduction in effective imperviousness for existing impervious areas and an equivalent open space in good condition for an area equivalent to the increase in impervious surface.
- 5.6.2.4.5.6.2.5 For those cases in which the minimum runoff reduction requirements are not met an offset in accordance with Section 13 shall be provided for any portion of the RPv that does not meet the requirements of Section 5.6.2.3 and 5.6.2.4 above.
- ~~5.6.2.2 Runoff from redeveloped areas within the project limit of disturbance that were wooded or meadow in the existing condition shall be reduced to an equivalent wooded condition using runoff reduction practices.~~
- ~~5.6.2.3 All remaining redeveloped areas within the project limit of disturbance shall employ runoff reduction practices to achieve a 30% reduction in the effective imperviousness based on the existing condition. For those cases in which the minimum runoff reduction requirements are not met:~~
- ~~5.6.2.3.1 The allowable discharge for any remaining runoff shall not exceed the equivalent 24-hr detention time of the RPv, and~~
- ~~5.6.2.3.2 An offset shall be provided for any portion of the RPv that does not meet the minimum runoff reduction requirements.~~
- ~~5.6.2.4 Additional water quality treatment BMPs may be provided if the runoff reduction requirements of this section are not sufficient to meet Total Maximum Daily Load (TMDL) requirements for the receiving water. Pollutant reductions achieved through the use of these treatment BMPs may be used to partially reduce a runoff reduction offset requirement provided in accordance with Section 5.6.3.2.2 above.~~

- 5.6.3 Any redevelopment project, including a contaminated or Brownfield site, that increases the rate, ~~volume~~ or duration of flow to a new or existing point of discharge during the Conveyance Event shall comply with the requirements of Section 5.3.
- 5.6.4 Any redevelopment project, including a contaminated or Brownfield site, that increases the rate, ~~volume~~ or duration of flow to a new or existing point of discharge during the Flooding Event shall comply with the requirements of Section 5.4.