



## **Standard No. 000.00            STORMWATER**

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The following Stormwater Standard consists of four parts: Statement of Intent, Definition of Terms, Stormwater Standard and Application Guidance.

### **INTENT:**

To establish policies for stormwater treatment within the right-of-way & Public Improvement Easements (P.I.E.) to offset the water quality impacts and water discharge increases from roadway runoff to the extent practical.

To establish vegetated integrated management practices (V-IMP's) as the preferred stormwater treatment method within rights-of-way.

To provide the design community and applicants with clear guidance, standards and updates in order to properly incorporate stormwater treatment within rights-of-way.

To provide concise definitions for known limiting factors such that if stormwater treatment goals cannot be met, it is reasonable to require that applicants clearly identify why not.

To establish protocols for updating this standard as advances in technology and engineering design allow, subject to County approval.

To assure that all roadway projects and development plans that affect Montgomery County rights-of-way, not to include resurfacing projects per Chapter 49 of the Montgomery County Code, continue to meet Maryland Department of the Environment (MDE) Stormwater Design Manual requirements.



## DEFINITIONS:

***Stormwater Runoff*** is liquid rain, and any precipitation that eventually melts and drains from the roadway.

***Stormwater Quality*** is affected by auto emissions, auto leakages, sand, salt and other incidental deposits on the road surface that may be washed away by stormwater runoff.

***Water Quality Volume (WQ<sub>v</sub>)*** is the volume of stormwater runoff required by the Maryland Department of Environment (MDE) or Montgomery County Stormwater Code that must be treated in order to satisfactorily mitigate roadway impacts to stormwater quality.

***Stormwater Discharge*** is the volumetric rate of stormwater runoff, and is required to be controlled so as not to erode and degrade natural channels downstream.

***Channel Protection Volume (CP<sub>v</sub>)*** is the volume of stormwater runoff required by MDE to be detained and slowly released in order to mitigate the increased stormwater discharge from impervious roadway areas.

***Stormwater Treatment*** can refer to either stormwater quality or stormwater discharge, or both.

***V-IMP's*** are Vegetated Intergrated Management Practices such as filtration or infiltration stormwater treatment measures with surface vegetation designed to withstand impacts from roadway runoff and enhance water quality through pollutant uptake and evapotranspiration. Detention basins and ponds that are vegetated only for slope stabilization are not considered to be V-IMP's for the purposes of Context Sensitive Road Design.

***Filtration Stormwater Measures*** require underdrains discharging into piped stormwater systems, or into an open channel discharge point. Insitu soil conditions with infiltration rates less than 0.5" per hour require underdrains for V-IMP's. Filtration Stormwater Measures achieve stormwater quality treatment by filtration through an engineered media.

***Infiltration Stormwater Measures*** do not typically require underdrains because insitu soil percolation rates are greater than 0.5" per hour.

***Non-V-IMP's*** are structural or non-structural water quality devices that are not listed above as V-IMP Measures such as Montgomery County sand filters or other proprietary cartridge systems. Non-vegetated IMP Measures may also include conventional ponds and basins.

***P.I.E's*** are Public Improvement Easements that are typically linear easements adjacent and contiguous to rights-of-way where impervious areas are publicly maintained.



## STANDARD

### 1. STORMWATER QUALITY

- A. New roadway projects and development plans proposing new roadways shall provide water quality volume ( $WQ_v$ ) treatment over the entire area of the right-of-way & P.I.E..
- B. Roadway renovation, widening or roadway improvements associated with development projects shall provide water quality volume ( $WQ_v$ ) treatment over all impervious areas within the limits of disturbance in the right-of-way & P.I.E. of the reconstructed roadway.
- C. All roadway projects shall incorporate V-IMP's; The goal is to treat 25%  $WQ_v$  by Vegetated Integrated Management Practices (V-IMP's) to the extent physically possible within right-of-way & P.I.E. buffers and/or medians for the given typical roadway section. For open section residential roads, the goal is to treat 60%  $WQ_v$  by V-IMP's within the right-of-way & P.I.E. to the extent practicable.
- D. The percentage of  $WQ_v$  managed within a right-of-way & P.I.E. will vary by the road section being applied, and according to the following:
  - i. V-IMP's that are suitable for meeting  $WQ_v$  shall follow Montgomery County Department of Permitting Services (DPS) standards and MDE standards where such standards exist, and include, but are not limited to:
    - a. Biofiltration (DPS Biofiltration Standard)
    - b. Bioretention (DPS Infiltration Trench Standard)
    - c. Bio-Swales (MDE Standard)
    - d. Curb Inlet Biofiltration Structures (MDE Standard)
    - e. Enhanced Wetland Facility (MDE Standard)
    - f. Grassed Swales (MDE Standard)
    - g. Open Section Roadways with Bio-Swales
    - h. Vegetated Continuous Trench (MDE Standard)
    - i. Vegetated Curb Extensions (DPS Biofiltration Standard)
  - ii. As the technology matures and evolves, Montgomery County shall, after receiving justification demonstrating the practical benefit of a proposed measure, update the list of suitable V-IMP's under 1.D.i.to include additional acceptable V-IMP measures. An applicant may, with County approval, request use of a V-IMP not previously implemented in Montgomery County.
  - iii. V-IMP's in the right-of-way & P.I.E. shall be considered as secondary to roadway safety elements. Such safety elements may include, but not be limited to hydrants, light poles, pedestrian access, signage, emergency access, clear zones, etc. However, placement of safety elements shall be coordinated to maximize V-IMP placement within the right-of-way & P.I.E. without compromising safety.



- iv. The spacing of new required street trees, utility poles and signage shall be integrated with V-IMP placement within the right-of-way & P.I.E. without excluding required street trees and applicable root zone requirements, utility poles or signage.
  - v. Utility line placement shall be optimized according to minimum utility separations in areas not suitable for V-IMP's before reducing V-IMP's in buffers and medians. The intent is to place new utility lines outside V-IMP buffer strips and medians to the extent practical unless that utility line can tolerate periodic wet conditions and run parallel within buffer strips without impeding the size and function and maintenance of V-IMP's. This does not preclude minimized crossings of V-IMP's by utility lines.
  - vi. Landscape and planting plans shall consider potential impacts of salt and other runoff pollutants on vegetation when making design selections of tree species and planting materials within and adjacent to V-IMP's.
- E. The balance of  $WQ_v$  required for each project that is not treated by V-IMP's within the right-of-way & P.I.E. shall be treated, and may be treated in the following manners, listed in order of preference:
- i. Additional V-IMP's may be placed outside the right-of-way & P.I.E..
  - ii. Structural, underground or cartridge water quality facilities may be placed within the right-of-way & P.I.E. without displacing V-IMP's.
  - iii. Additional non-V-IMP stormwater treatment may be placed outside the right-of-way & P.I.E..
- F. Open section design utilizing Bio-Swales shall be the preferred option for rural roadway stormwater treatment.
- G. Should an applicant be unable to achieve the  $WQ_v$  goals for a project stated in Section 1.C. of this standard, the applicant shall quantify the percentage of  $WQ_v$  provided in the right-of-way & P.I.E. and identify the specific constraints limiting achievement of the  $WQ_v$  goal as part of the review and permitting process with Montgomery County. It must be clear and evident in graphic and/or written descriptions and justifications that V-IMP's have been placed inside the right-of-way & P.I.E. to the greatest extent practical. At the onset of this standard, acceptable limitations for V-IMP placement may include, but not be limited to:
- i. Intrusion of safety elements into buffers that cannot be placed in any other practical location.
  - ii. Existing underground utility lines that would be dangerous to co-mingle with saturated ground conditions.
  - iii. Subgrade conditions that would become unstable with water intrusion combined with an inability to provide impermeable membranes around water treatment facilities.
  - iv. Impeding locations of existing street trees and root zone requirements that are not otherwise required to be removed for the roadway construction.



- v. Impediments from required new street trees and root zone requirements that cannot be accommodated in any other practical manner.
  - vi. Site constraints including slopes, grades, soils, wetlands, environmental protection areas, and others that would result in more detriment than benefit upon installation.
  - vii. Other justifications not listed above that are encountered may be submitted for acceptability to the county and made publicly available to the design community when found acceptable, as stated in (4.).
  
- 2. **STORMWATER DISCHARGE:** All new roadway projects, roadway renovation projects and development plans having roadway components shall provide channel protection storage volume (CP<sub>v</sub>) in accordance with MDE regulations. Additional flexibility and credits apply as stated below.
  - A. CP<sub>v</sub> for the roadway right-of-way & P.I.E. only may be provided within the right-of-way & P.I.E. subject to County approval. Water quantity devices placed within the right-of-way & P.I.E. are subject to the same spatial limitations stated in 1.D. and subsections.
    - i. New roadways shall provide CP<sub>v</sub> for the entire right-of-way & P.I.E. being improved.
    - ii. Roadway renovation, widening or roadway improvements associated with development projects shall provide CP<sub>v</sub> for the limits of disturbance within the right-of-way & P.I.E..
  
  - B. CP<sub>v</sub> credit for all water quality measures shall be granted as much as is currently and subsequently quantified and proven valid to MDE.
  
- 3. **MAINTENANCE :** Montgomery County shall maintain stormwater treatment measures installed by permit within the right-of-way & P.I.E..
  - A. Applicants shall submit maintenance schedules and life-cycle cost estimates for all water quality and water quantity measures proposed in the right-of-way & P.I.E..
  - B. As part of a coordinated maintenance plan, the maintenance logistics and traffic operations during maintenance activities of stormwater facilities in the right-of-way & P.I.E. shall be outlined.
  
- 4. **MODIFICATIONS:** This standard is written with the expectation that future innovations in stormwater treatment will develop.
  - A. When studies or design plans document innovative vegetated stormwater treatment that fits within rights-of-way and which meets or exceeds MDE and Montgomery County stormwater regulations, the County may consider such studies and plans to be the basis for modifying this standard after such advances have been proven to provide measureable and practical stormwater treatment benefits.
  - B. All newly permitted stormwater treatment facilities in Montgomery County not explicitly listed in this standard shall be the basis for a modification of this standard. Such newly permitted stormwater treatment facilities shall be posted to [montgomerycounty.gov](http://montgomerycounty.gov) and the plan announced to the design community.



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- C. Such stormwater treatment applications shall be aggregated as amendments to the Road Code not less than once every calendar year in years when acceptable modifications have been demonstrated. Montgomery County shall coordinate additional aggregated guidance and illustrations for the design community to use based on these specific permitted stormwater applications.
- D. The  $WQ_v$  goal established in Section 1.C of this standard shall be reassessed every three (3) years. The goal may be changed if justified by new data or evidence.

**APPLICATION GUIDANCE:**

V-IMP's in the right-of-way & P.I.E. are anticipated to be primarily linear stormwater treatment features in buffers and median strips. Placement of V-IMP's that do not actually receive runoff from impervious areas will not meet the intent of this standard. V-IMP's shall be placed so as to maximize interception of stormwater runoff and pollutant removal from impervious surfaces in the right-of-way & P.I.E..