



Stormwater Management Minimum Requirements



Article 7, Division II of the City Code requires that land disturbance activities must have stormwater management plans approved by the Department of Public Works (DPW). The stormwater management plans must also comply with the *2000 Maryland Stormwater Design Manual (Revised)* which is available on-line. In order to determine the minimum design requirements for stormwater management, a developer must follow these steps:

1. Delineate the site.
2. Identify the land disturbance activity type.
3. Measure the existing impervious area.
4. Determine the development type.
5. Identify the 8-digit watershed.
6. Estimate the proposed impervious area and changes to drainage patterns.
7. Calculate the minimum requirements for stormwater management.

1. Delineate the Site

Any site exceeding 5,000 square feet in area requires stormwater management. The site is defined as any tract, lot, or parcel of land, or combination of tracts, lots, parcels of land, or area of construction that are in one ownership or part of a single project. If a single developer is proposing a project to construct 6 row homes within a City block, then the combined construction activities for those 6 homes is considered as the site.

Generally, the site is typically the legal boundaries of the parcel(s). When only a portion of the parcel is to be disturbed, the site can be just the limit of land disturbance within the parcel. Land disturbance includes, but is not limited to:

- clearing or removing trees and brush from land;
- grading, stockpiling, removing, excavating, scarifying, or filling soil;
- grubbing or removing stumps;
- stripping or removing vegetative surface cover; or
- altering a pervious surface by vehicular traffic and construction activities.

An existing building may be excluded from the site if there are no land disturbance activities within the building. If the limit of disturbance extends into the public right-of-way, then the site must include that limit of disturbance within the right-of-way. DPW delineates the limit of disturbance as a minimum of 10 feet from the edge of trench or stockpile to allow for vehicular traffic around the construction activities.

Any pervious areas used for non-structural stormwater management (areas used for disconnection of runoff or conservation areas) must be included in the site.

2. Identify the Land Disturbance Activity Type

All land disturbance activities require stormwater management, except for agriculture activities. DPW must approve the qualification for this exemption. Some maintenance activities may qualify for a waiver from stormwater management, pending DPW's approval. Maintenance may include, but is not limited to:

- Pavement overlay, asphalt milling / grinding and asphalt resurfacing;
- Pavement patching;
- Pavement rehabilitation and in-kind replacement of impervious surfaces for maintenance purposes;
- Replacement of impervious surfaces removed for the purpose of underground utility and pipe work;
- Landscaping projects;
- Underground activities involving pipelines, conduits, tunnels or sanitary sewers; and
- In-kind storm drain replacement / remediation.

If the land disturbance activity is performed as part of a State or Federal-controlled project, then stormwater management plan approval should be obtained from the Maryland Department of Environment.

3. Measure the Existing Impervious Area

Stormwater management requirements are based on the amount of impervious surfaces within the site under existing conditions. Impervious surfaces are any surfaces that do not allow stormwater to infiltrate into the ground surface. Some land use conditions that would otherwise be considered as impervious surface may be exempt from the stormwater management requirements, pending DPW's approval. These land uses include:

- Gravel used for landscaping, decoration, or ground stabilization, but not compressed by pedestrian or vehicle traffic.
- Gravel used as ballast for railroads.
- Rooftop or pavement where drainage is permitted by DPW to directly connect to the public wastewater system under a wastewater discharge permit.
- The portion of ground underlying a solar panel which excludes the foundation and base of the solar panel device, provided that the ground surface is stabilized with vegetative cover or a gravel bed.
- Any portion of a deck that is not directly touching the ground surface, is constructed with gaps between the boards, and where the ground underneath is stabilized with vegetative cover or a gravel bed.

The existing land use represent land surface conditions at the time that stormwater plans are submitted for review except for the following:

- If impervious area has been removed from the property, stayed in the same ownership, and the developer has proof (typically a demolition permit or as-built survey) of the

previous impervious area within the last five (5) years, then the developer can claim this former impervious area.

- If the Site Areas was previously a contaminated site which is part of the MDE's Voluntary Cleanup Program (VCP) and the developer provides a copy of the VCP permit to DPW, then the "existing site conditions" will consider the impervious area at the time that the VCP permit was issued.

4. Determine the Development Type

DPW recognizes four development types, based on the existing and proposed impervious area and the intent of the construction activity:

- ***New development*** is applicable to sites where the existing impervious area is less than 40 percent of the Site Area.
- ***Redevelopment*** is applicable to sites where the existing site impervious area exceeds 40 percent of the Site Area and the proposed impervious area will not exceed existing conditions.
- ***Quasi-redevelopment*** is applicable to sites where the existing site impervious area exceeds 40 percent of the site area and the proposed impervious area will exceed existing conditions.
- ***Restoration*** is applicable to any construction, alteration or improvement for the sole purpose of installing a stormwater management practice or voluntary land use change to decrease runoff. These projects may have impervious surfaces, limited only for utility maintenance or access purposes.

5. Identify the 8-digit watershed

There are five 8-digit watersheds in Baltimore City as designated by the Maryland Department of Natural Resources:

- Back River
- Baltimore Harbor
- Jones Falls
- Gwynns Falls
- Lower North Branch of the Patapsco River (LNB Patapsco)

All of the watersheds, except for Baltimore Harbor and LNB Patapsco, are considered inter-jurisdictional, specifically meaning that the non-tidal drainage area is shared with Baltimore County. Inter-jurisdictional watersheds are required to control the 100-year flood. The delineation of the watersheds are mapped on DNR's website. Note that although the Baltimore Harbor watershed is not considered inter-jurisdictional, DPW requires quantitative control for the neighborhoods of Cherry Hill, Fells Point, and Canton, which experience pluvial flooding. Sites or portions of sites which directly discharge to tidal waters are exempt from quantitative control requirements; these areas must be delineated on the plans.

6. Estimate proposed impervious area and changes to drainage patterns

Stormwater management requirements are based on the amount of impervious surfaces within the site under proposed conditions. For redevelopment projects, this includes the decrease of impervious areas. At the concept level of design, DPW recommends that the developer use a conservative estimate (largest amount) of the impervious area. Topographic changes on the site must be considered if it will affect the drainage patterns, specifically the discharge locations from the site. If a site is designated as redevelopment but the discharge location changes to a different part of the storm sewer system, then quantitative controls will be required.

7. Calculate the minimum requirements for stormwater management.

Stormwater management is categorized as qualitative control and quantitative control. Qualitative control relates to reduction or elimination of pollutants that might otherwise be carried by surface runoff. Specifically, qualitative control parameters are water quality volume and recharge volume. Quantitative control relates to the control of the increased volume and rate of surface runoff caused by man-made changes to the land. Quantitative control design parameters include:

- Channel protection volume (CPV): 24-hour extended detention of a one-year storm, 24-hour storm event comparing proposed conditions to the site in woods in good condition. Note that this is not required for tidal portions of the watershed.
- Overbank flood protection volume (Q10): control of the peak flow rate of a 10-year storm comparing proposed conditions to existing conditions.
- Extreme flood volume (Q100): control of the peak flow rate of a 100-year storm comparing proposed conditions to existing conditions.

Sizing criteria and specific applications for BMP type are provided in the *2000 Maryland Stormwater Design Manual (Revised)*, and other technical memos issued by MDE, available on MDE's website. Proposed stormwater management must demonstrate ESD to the MEP (maximum extent practicable), meaning that an evaluation is required of physical site conditions which may prohibit reasonable opportunities for on-site stormwater management system implementation and that environmental site design (ESD) must be the first approach in stormwater management design, followed by structural practices then alternative practices. If the developer has demonstrated MEP for on-site stormwater management, but has still not met the minimum requirements, then DPW may consider proposed off-site treatment or a fee-in-lieu of treatment. Off-site treatment should be within the same 8-digit watershed, within the City.



The minimum requirements, based on development type, are summarized in the following table.

Table 1: Summary of Stormwater Management Requirements

Development Type	Qualitative Control	Quantitative Control
Redevelopment	Treatment of 0.5 inch; or 50% removal of impervious surface area; or Combination of both.	None, unless drainage patterns change.
New development	Treatment of 1.0 inch	CPV and Q10 are required in all areas, except if directly discharging to tidal areas. Q100 is required for inter- jurisdictional watershed and flood hazard areas noted in this document.
Quasi-redevelopment	Follow redevelopment requirements for existing impervious area. Follow new development requirements for proposed additional impervious area.	
Restoration	No requirement but technical review is required to confirm proposed controls.	No requirement but technical review is required to confirm proposed controls.