



SOLUTIONS

Industry Resources by Koontz-Bryant, PC

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Stormwater Management 101 Basic Principles of Stormwater Management

Stormwater Management

Stormwater management for a project is typically made up of two elements: water quantity and quality. By temporarily storing water, detention slows the rate of runoff to pre-development quantities based on certain design storm criteria. The second element is water quality, with the design constraint typically being tied to total phosphorus levels. The general thought is that if you are reducing the total phosphorus, other impurities that are more difficult to test and measure are also being reduced.

Design Storm Events

The engineering design for stormwater management must allow for specific "storm events." These events are typically referenced as a 10-year storm or 100-year storm. What does this really mean? It does not mean that a 10-year storm occurs every 10 years. A 10-year storm has a 10% chance of occurring every year. This table shows the chance of each design storm occurring in a year.

Storm Event	Percent chance of occurrence each year
2 Year	50%
10 Year	10%
50 Year	2%
100 year	1%

Detention Requirements

Detention regulations can vary by locality. Current statewide regulations require that after development, runoff rates for a 10-year storm can be no greater than they would have been in a 10-year storm before development. This is accomplished by temporarily detaining runoff in ponds or other structures. Many localities have increased requirements due to areas already having flooding issues. Developed localities may have areas with 50-year post-development storms detained back to the 10-year pre-development storm. These increased detention requirements can significantly affect the volume required for the stormwater management facility.



Water Quality Requirements

Water quality requirements can also vary by locality and within specific watersheds. The state has set out minimum guideline based calculations of total phosphorus from an assumed pre-development value of 16% impervious area. Localities can be stricter, and many are. For instance, both New Kent Co. and the Upper Swift Creek Watershed in Chesterfield Co. use 8% for residential development and 16% for commercial development as the pre-existing condition. Post-development runoff must be treated to obtain no net increase in phosphorus runoff, or to the maximum extent practical.

Best Management Practices (BMP)

Everyone that has been working in site development over the last 10-15 years has heard the term BMP, which stands for Best Management Practice. Typically these are structures or technology used to manage or treat the water to remove phosphorus. BMPs most frequently used are filter strip, dry ponds, wet ponds, sand filters and bio-retention facilities.

Design Considerations

Your consultant should thoroughly understand project requirements and site physical constraints. Many times the physical site constraints will limit the choice of BMP that may be used for a project. Multiple types of structural BMP should be considered during the design stage on each project to balance the owner's site development potential and associated construction costs. Owners also need to be aware of the ongoing maintenance, inspection and reporting requirements for BMP facilities within the jurisdiction of authority.



For more information, or for help with your specific Stormwater Management issues and questions, contact Koontz-Bryant, P.C.

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