

CONSERVATION DESIGN FOR STORMWATER MANAGEMENT

DEFINITION

Conservation Design for Stormwater Management follows a low-impact strategy for both site design and stormwater Best Management Practices (BMPs). Conservation Design for Stormwater Management is a nonstructural approach which places less emphasis on structural stormwater practices—such as large ponds and sand filters—and instead focuses on reducing impervious surfaces. Conservation Design techniques also highlight the value of a water-budget approach to site design where recharge of groundwater from rainfall is an important consideration.

WATER QUALITY IMPACTS & TYPICAL LOADINGS

In general, the amount of phosphorus and nitrogen washed off urban and suburban lands is directly related to the amount of impervious cover present in that drainage area (Schueler 1998). As a result, site development employing Conservation Design for Stormwater Management practices minimize runoff *rates* and *volumes* through infiltration.

MANAGEMENT TECHNIQUES & TYPICAL REDUCTIONS

Non-Structural approaches to Stormwater Management include measures that:

- reduce impervious cover,
- spread runoff over areas that promote infiltration,
- utilize open channel drainage/swales, and
- use natural areas including buffers for stormwater purposes.

Management techniques for reducing impervious cover can range from reducing road widths and clustering residential dwellings, to encouraging shared parking facilities and driveways. Medium residential developments employing Conservation Design for Stormwater Management have been estimated to reduce nutrient loading as much as *40 to 60 percent less than conventional site development*.

The Conservation Design also features a strategy that combines reduction in impervious cover with the need to replicate, as closely as possible, pre-development hydrology. A residential subdivision that utilizes a cluster option for the homes increases the amount of open space that could typically be used to meet stormwater management needs. With less impervious cover, less runoff is generated.

TYPICAL COSTS

The use of Conservation Design for Stormwater Management may reduce project costs associated with land development. Home clustering reduces the amount of roadway and utilities necessary to serve residential communities. Compared to traditional approaches, Conservation Design approaches can also provide substantial stormwater management savings:

- Use of Conservation Design techniques in a Davis, California residential development saved \$800 per home (Lipan and Brown 1996).
- A Delaware DNREC subdivision redesign example for Tharpe Knoll reflected a 56-percent infrastructure cost savings.

IMPLEMENTATION ISSUES

Not every land development project can use the Conservation Design principles described. Physical site features—soils, topography, wetlands, and proximity to ground and surface water bodies—influence design suitability. More importantly, proper site conditions, planning, and zoning restrictions may even *discourage* use of Conservation Design in site development. Land use agencies need to recognize the present codes, comprehensive plans, and laws *may not* support the progressive design elements that can be incorporated into the land development process. Public education is crucial—to demonstrate to the land development community and to regulators—that innovative approaches to stormwater management can work better, be less costly, and positively affect both the environment and regional economic development.

For more information, please see “Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use” by the Department of Natural Resources and Environmental Control and The Environmental Management Center of the Brandywine Conservancy, September 1997.

BROADKILL WATERSHED

This fact sheet was prepared by the Delaware Department of Natural Resources and Environmental Control's Whole Basin Team for citizens and stakeholders interested in one of Delaware's most environmentally and economically attractive areas—the Broadkill River and its surrounding lands, surface and ground waters.

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