

Nonstructural Best Management Practices

A core concept of LID is preventing stormwater runoff by integrating site design and planning techniques that preserve natural systems and hydrologic functions, protect open spaces, as well as conserve wetlands and stream corridors on a site. This chapter provides detailed technical information on integrating nonstructural Best Management Practices (BMPs) early into the site design process.

The nonstructural BMPs are:

- Cluster development,
- Minimize soil compaction,
- Minimize total disturbed area,
- Protect natural flow pathways,
- Protect riparian buffers,
- Protect sensitive areas,
- Reduce impervious surfaces, and
- Stormwater disconnection.

Specifically, this chapter discusses:

- The benefits of using nonstructural BMPs,
- The process for selecting nonstructural BMPs,
- Fact sheet overviews of each BMP, and
- Detailed information for each BMP including design considerations, construction guidelines, stormwater calculations, and maintenance and cost information.

What does nonstructural mean?

The primary LID characteristic of nonstructural BMPs is preventing stormwater runoff from the site. This differs from the goal of structural BMPs which is to help mitigate stormwater-related impacts after they have occurred.

More specifically, nonstructural BMPs take broader planning and design approaches, which are less “structural” in their form. Many nonstructural BMPs apply to an entire site and often to an entire community, such as wetland protection through a community wetland ordinance. They are not fixed or specific to one location. Structural BMPs, on the other hand, are decidedly more location specific and explicit in their physical form.

Benefits of using nonstructural BMPs

There are numerous benefits of incorporating nonstructural BMPs into a site. While individual benefits are discussed in detail under each BMP, there are many benefits that apply to most, if not all, of the nonstructural BMPs. These include:

- Reduced land clearing costs,
- Reduced costs for total infrastructure,
- Reduced total stormwater management costs,
- Enhanced community and individual lot aesthetics, and
- Improved overall marketability and property values.

Figure 6.1
LID Site Design Process

Step 1

Property acquisition and use analysis

Step 2

Inventory and evaluate the site

Step 3

Integrate municipal, county, state, and federal requirements

Step 4

Develop initial concept design using nonstructural BMPs

Step 5

Organize pre-submission meeting and site visit with local decision makers

Step 6

Incorporate revisions to development concept

Step 7

Apply structural BMP selection process

Step 8

Apply the LID calculation methodology

Step 9

Develop the preliminary site plan

BMP Selection Process

This chapter focuses on Step 4 in the site design process for LID (Figure 6.1) to develop the initial concept design using nonstructural BMPs. Selection of nonstructural BMPs should focus on information gathered in Steps 1-3 of the site design process. Following are specific questions and issues to provide guidance in the selection process.

- How is the property being used? A residential development may have more applicability for certain nonstructural BMPs than other land uses. For example, cluster development is an applicable BMP for residential development, but may be less used in more urban situations.
- What natural features are on site? A thorough site inventory will provide the necessary information to assess the ability to implement many of the BMPs, including preserving sensitive and riparian areas.
- What local, county, state, and other regulations need to be met? A review of local, county, state, and other regulations can also provide guidance on selecting the right mix of nonstructural BMPs.

BMP Fact Sheet and Detailed Nonstructural BMP Information

Each BMP begins with a fact sheet that provides a quick overview of the BMP, along with a local case study. The fact sheets can be removed separately from the manual and serve as a stand-alone document for quick reference. Fact sheet ratings have been condensed to general categories (High, Medium, and Low) with these summary ratings often discussed in more detail in the BMP text. Stormwater Quality Functions are based on a compilation of recent national/international studies rating pollutant removal performance.

Following each fact sheet is detailed information on the BMP which includes:

Variations

Discusses the variations to the BMP, if there are applicable. Examples include alternatives in design that can increase storage capacity or infiltration rates.

Applications

Indicates land use types for which the BMP is applicable or feasible.

Design Considerations

This section includes a list of technical procedures to be considered when designing for the individual BMP. This specific design criteria is presented, which can assist planners in incorporating LID techniques into a site design, as well as provide a basis for reviewers to evaluate submitted LID techniques.

Stormwater Calculations and Functions

Provides specific guidance on achieving sizing criteria, volume reduction, and peak rate mitigation, as applicable. This section also references Chapter 9 which discusses in detail how to achieve a specific standard or implement measures that contribute to managing water onsite in a more qualitative manner.

Construction Guidelines

Provides a typical construction sequence for implementing the BMP. However, it does not specifically address soil erosion and sedimentation control procedures. Erosion and sediment control methods need to adhere to the latest requirements of MDEQ's Soil Erosion and Sedimentation Control Program and local standards.

Maintenance

Provides guidance on recommended maintenance procedures for the BMP.

Winter Considerations

Discusses how well the BMP performs in Michigan's cold climate.

Cost

Provides general cost information for comparison purposes. If specific dates of costs are not referenced in this section, the costs reflect 2007 conditions.

Designer/Reviewer's Checklist

Developed to assist a designer and or reviewer in evaluating the critical components of a BMP that is being designed. It references not only individual design considerations, but also suggests review of additional pertinent sections of the LID manual that may need to be considered for implementation of that BMP.

References

Provides a list of sources of information utilized in the creation of this section of the manual. This list also provides additional sources that can be used for additional information.