

Low Impact Development

Balancing Development with Water Quality Protection

LID NEWS is a newsletter designed to inform elected and appointed officials in southwest Michigan about LOW IMPACT DEVELOPMENT (LID). The LID approach to land development utilizes various land use planning and design practices and technologies to simultaneously protect water quality and reduce infrastructure costs.

General LID Concepts

One of the largest components of LID involves stormwater management. Conventional stormwater management methods move rainwater off-site, usually through pipes, as quickly as possible. LID aims to mimic natural hydrology and processes by using small-scale, decentralized practices that infiltrate, evaporate, and transpire rainwater. With LID, the ultimate goal is to keep as much rainfall on-site as possible through infiltration. What cannot be kept on-site is treated/filtered and slowed down before leaving the site. Specifically, LID aims to



identify solutions that integrate the following concepts:

- ☔ Utilize clustered housing sites to preserve open space, minimize land disturbance and reduce street length
- ☔ Protect and incorporate natural systems (wetlands, stream/wildlife corridors, mature forests) as design elements;
- ☔ Minimize impervious surfaces (roofs, roads, driveways);
- ☔ Increase the flow path for stormwater runoff; and
- ☔ Utilize smaller, more decentralized treatment practices instead of centralized collection or detention areas

Definition of LID

Low Impact Development (LID) is an approach to land development that uses various land planning and design practices and technologies to simultaneously **conserve and protect natural resource systems and reduce infrastructure costs.**

LID Techniques

LID techniques perform both runoff volume reduction and pollutant filtering functions resulting in cleaner water and less potential for flooding. These techniques work for new development and redevelopment projects.

LID Techniques Include:

1. Open Space and Sensitive Area (wetlands, floodplains, dunes, etc.) Preservation
2. Bioretention Areas/Rain Gardens
3. Grassed Swales (instead of curb and gutter)
4. Native Plant Landscaping
5. Permeable/Porous Pavement
6. Reduced Impervious Surfaces
7. Disconnected Downspouts (rain barrels)
8. Green Roofs

This newsletter edition will explore techniques 1- 4 and the next edition will go into more depth on techniques 5-8.

As a local official, you can ensure that your zoning ordinance allows, or better yet, encourages LID techniques to be used in all new developments or redevelopments in your community. If you need assistance, ask your planning and zoning staff and/or consultant.

Most photographs in this edition are courtesy of the Pokagon Band of Potawatomi Indians. The photos showcase their *low impact* housing development southeast of Dowagiac, Cass County, Michigan. This development helps to maintain water quality in the Dowagiac River Watershed.

1. Open Space and Sensitive Area Preservation

Site development layouts should be prepared with the preservation of natural features and the clustering of buildings and infrastructure. These techniques can significantly reduce the stormwater impacts of development.

☀️ **Clustering buildings** allows for maximum preservation of natural areas, a reduction in infrastructure such as roads, and minimization of impervious area.

☀️ **Building setbacks and naturally vegetated buffers along sensitive environmental areas such as streams, rivers and wetlands** are essential to protect water quality. A 100 foot buffer is the most effective in most situations; however even a 25-50 foot buffer is better than none at all.

☀️ **Natural vegetation** should be preserved as much as possible. Particular attention should be paid to protecting larger trees and areas of native vegetation that act as buffers between building areas and environmentally sensitive areas such as rivers, streams, wetlands and lakes. Vegetation acts as a filter and absorbs water, which reduces the amount of stormwater runoff. Without this filtering, runoff would flow through storm drains and directly into streams, lakes or wetlands. *Lawns and turf areas are not adequate substitutes for meadows and woods.*

☀️ **Steep slopes** should be considered environmentally sensitive areas and should be disturbed as little as possible. Steep slopes have significant potential for erosion when disturbed, increasing sediment loading to water resources.

Did you know that communities designed to maximize open space and preserve mature vegetation are highly marketable and command higher lot prices?



This development clusters houses, preserves open space and provides a wide setback and buffer along the river.

2. Bioretention Areas/Rain Gardens

Storm water directed to these shallow depressions in the landscape is filtered, stored, and infiltrated into the ground by native plants and soils. These areas are designed to drain in 24-hours, with no risk of standing water and breeding of mosquitoes. A rain garden typically does not have the full spectrum of engineered features that bioretention areas have, such as underdrains and a special soil mix. Rain gardens can be easily designed

and built by homeowners and located near a drainage area, such as a roof downspout. Typical uses include parking lot islands, edges of paved areas (roads or parking lots), and adjacent to buildings, open space, or in median strips. They are ideal for commercial, industrial, and residential (urban, suburban, ultra-urban) and are suitable for new construction and redevelopment projects. Visit

www.raingardens.org to learn how to plant a rain garden in your yard.



Each house in the Pokagon Development has a rain garden with native plants.



Parking with bioretention area.

3. Grassed Swales

Vegetated or grassed swales are used to convey stormwater runoff, but unlike standard drainage channels, they are designed to also improve stormwater quality. These open, shallow channels with dense vegetation slow runoff, filter it, and promote infiltration into the ground; and as a result, runoff volumes are smaller, peak discharge rates are lower, and runoff is cleaner. In contrast, the standard approach of using curbing on streets and parking areas impairs natural drainage systems and quickly conveys polluted runoff to nearby streams, rivers and lakes.

Engineered grassed swales can be a low-cost alternative to curbs, gutters, and storm drains. The cost for traditional structural conveyance systems ranges from \$40–\$50 per running foot. This is two to three times more expensive than an engineered grass swale (Center for Watershed Protection, 1998). Concerns that open channels are potential nuisance problems, present maintenance problems, or impact pavement stability can be alleviated by proper design. Periodic removal of sediments and mowing are the most significant maintenance requirements.



The Pokagon Development uses grassed swales instead of curb, gutter and storm drains.

Typical uses include edges of paved areas (roads or parking lots), parking lot islands, common or open spaces, and adjacent to buildings. Grassed swales are appropriate for commercial, industrial, residential (urban, suburban, ultra-urban); transportation projects (highway medians); new construction, and redevelopment projects.

4. Native Plant Landscaping

It is increasingly recommended that native plants (vegetation that grows naturally in particular climates or regions) be used because of their performance, site enhancement, and life cycle cost benefits. Native plants typically cost more initially (depending on local

availability); however, they are more cost-effective in the long run because they require less water and fertilizer, and are more resistant to local pests and diseases than non-native ornamentals. Native plants are also known to be very effective in managing storm water because many species have deep root systems which stabilize soil and facilitate the infiltration of storm water runoff. Additionally, native plants provide habitat for birds, butterflies and other wildlife.

When selecting native plants for a landscape design, it is important to have knowledge of the site conditions. Plant materials should be selected for their form, color, and texture, as well as solar, soil, and moisture requirements. Plants that do well in various microclimates on a site are considered "site appropriate."



A native prairie planting at the Pokagon Development. In this development, native plants are used on individual lots and in the common and open space areas.

For more on native plants visit: <http://www.macd.org/rollovers/nativeplants/nphome.html>

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5 Things YOU Can Do To Promote LID in YOUR Community

1. Learn more about LID and become an advocate.

Although low impact development is gaining popularity, it is still a relatively new approach. Learning more about it and how it might work in your community is a good first step, allowing you to become an informed advocate of the approach. Several excellent websites can be found at www.swmpc.org/LID.asp

2. Spread the word, especially to decision-makers.

Once people learn about the multiple benefits of LID, they often become strong advocates themselves. It is especially important to speak with public works and engineering staff, planning commission members and local elected officials about the LID approach and its benefits.

3. Reach out to developers.

Many communities are recognizing the benefits of establishing stronger working relationships with developers in fostering more sustainable development practices. Low impact development represents an excellent opportunity for such cooperation. Developers can be acquainted with the approach and its benefits, and encouraged to integrate LID features into proposed projects.

4. Get projects on the ground.

A completed project that employs LID principles and techniques is a powerful public education tool for promoting the approach. There's nothing like having a successful project to help to convert critics. A municipal project is the perfect place to start. It is easy to incorporate LID techniques into small and large municipal projects such as landscaping work, park improvements, parking areas, new buildings, etc.

5. Make sure your ordinances are LID friendly.

If your ordinances contain provisions that not only allow, but also promote the approach, LID projects are much more likely to be proposed and built in your community.

Future Issues of this newsletter will address: More LID techniques, barriers to implementing LID, what local government can do to promote LID and examples of LID projects in southwest Michigan. *

*If you know of a LID project in southwest Michigan, please contact: **Marcy (269) 925-1137 x25**

Also, for more information or questions:

Black River Watershed: Erin Fuller (269) 657-4030 x5

www.vbco.org/blackriver_2.asp

Galien River Watershed: Jean Brokish (269) 469-2330

www.swmpc.org/galien_river.asp

Gun River Watershed: Shawn McKenney (269) 673-8965 x3

www.allegandcd.org/gun-river

Paw Paw River Watershed: Matt Meersman (269) 925-1137 x22

www.swmpc.org/pprw.asp

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