Summer 2007 Edition 4

LID NEWS

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.

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.

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 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 5-8. The previous newsletter edition explored techniques 1- 4. (Visit www.smpc.org/lid.asp for past newsletter editions.)

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. For more information visit www.swmpc.org/lid.asp.

5. Permeable/Porous Pavement

Porous pavers in the Pokagon Development.

Permeable or porous pavement surfaces are suited for parking lots, low traffic residential streets and sidewalks. The porous or permeable surfaces allow stormwater to infiltrate into underlying soils promoting pollutant treatment and groundwater recharge, as opposed to producing large volumes of rainfall runoff requiring conveyance and treatment.

Since paved surfaces make up a large portion of the urban (or developed) landscape, the use of porous/permeable surfaces is very effective at stabilizing the hydrologic condition of a site. A secondary benefit of porous/permeable paving is its performance in snowy conditions. Cahill Associates

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.

reports an increase in demand for the installation of permeable asphalt in the Northeast as a result of reduced maintenance costs (snow shoveling and desalting) due to rapid snowmelt as a result of the permeable surfaces.

Permeable paving options include permeable asphalt, permeable concrete, grid block pavers, plastic grids, vegetated grids, Belgium block, turf block, gravel, cobbles, brick, natural stone, etc.

Typical uses include parking bays, parking lanes, sidewalks, and roads. Block pavers, bricks and porous/permeable asphalt or concrete are generally used in higher traffic parking and roadway applications; while plastic grid systems are more commonly used in auxiliary parking areas and roadways. Porous pavement is ideal for commercial, industrial, and residential (urban, suburban, ultra-urban) and is suitable for new construction and redevelopment projects.

For more information on permeable or porous paving options visit: http://www.greenworks.tv/stormwater/porouspavement.htm

6. Reduced Impervious Surfaces

Many strategies exist to reduce the amount of impervious surface in development areas.

Development Layout and Design

The clustering of buildings limits the amount of roads and other infrastructure needed to serve the development. The building footprint size can be reduced by constructing a taller building or including parking facilities within the building itself.

The Pokagon development utilizes narrow streets and porous pavers.

Roads/Streets/Parking Areas

Often, road widths specified in traditional subdivision regulations and parking lot requirements are often far larger than necessary. Road widths can be reduced to the minimum required for traffic considerations and emergency vehicle access. The national standard for road width is 18 feet. Cul-de-sacs may similarly be reduced in size, although in some cases this will require modifications of frontage requirements. Often alternative street designs rather than traditional grid patterns and reduced setbacks and frontages for homes will reduce road and driveway lengths.

Other practices include shared driveways and parking lots and porous pavements for overflow parking areas. Vegetated islands in cul-de-sacs reduce overall impervious surface and can be designed to receive stormwater runoff from the surrounding pavement.

Sidewalks

Limiting sidewalks to one side on local low traffic roads and limiting the area of impervious sidewalk by utilizing permeable surfacing can reduce the overall area of impervious sidewalks.

7. Disconnected Downspouts (rain barrels)

It is beneficial to view rainwater as a resource that can be reused on site. For example, downspouts from roofs can be disconnected from underdrains and the water directed to vegetated areas or a rain garden (see last newsletter edition for more on rain gardens). This will reduce runoff volume, promote infiltration and slow and filter runoff from the roof area. As long as the water is transported well away from foundations, concerns of structural damage and basement flooding can be alleviated.

Cisterns and rain barrels are simple techniques to store rooftop runoff for reuse in landscaping and other nonpotable uses. **You can make your own rain barrel by following instructions on this website: http://www.raingardens.org/Rain_Barrels.php.**

8. Green Roof

Did you know… one inch of rain on a 1,000 square-foot roof yields approximately 623 gallons of water?

Green roofs are an effective means of reducing stormwater runoff by reducing the percentage of impervious surfaces in urban areas. A green roof is a low-maintenance vegetated roof system that stores rainwater in a lightweight soil medium, where the water is taken up by plants and transpired into the air. As a result, much less water runs off the roof, as compared to conventional rooftops. Green roofs can be used on expansive concrete roof buildings ("big boxes") or small-scale residential roof structures. They are especially effective in older urban areas with chronic combined sewer overflow (CSO) problems due to high levels of imperviousness.

Green roofs offer a variety of other benefits beyond water quality, such as:

- extending the life of a roof (2 to 3 times more than a conventional roof)
- reducing building energy costs,
- providing aesthetic improvements in urban areas
- reducing the urban “heat island” effect
- improving air quality and
- conserving valuable land that would otherwise be required for stormwater runoff controls.

Green roofs can be seen in **Battle Creek**, **Chicago** and **Grand Rapids**. In fact, there are over 40 green roofs in Chicago. Many municipalities are installing green roofs on public buildings (city halls or public works buildings) to demonstrate the benefits to developers.

For more information on green roofs visit: http://www.hrt.msu.edu/greenroof/ or http://www.epa.gov/hiri/strategies/greenroofs.html

Green roof on Battle Creek’s public safety building.

Expansive green roof on the Ford Rouge Plant in Dearborn, Michigan. www.thehenryford.org/rouge/livingroof.asp

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Overcoming Barriers to LID

To increase the use of LID in SW Michigan, some barriers must be overcome. People must realize that LID techniques can be applied in both new and redevelopment projects. LID practices are dependent on site conditions, and are not based strictly on spatial limitations. Evaluation of soil permeability, slope and water table depth must be considered in order to choose appropriate LID techniques. One of the **major barriers** to using LID is many communities have **development rules** that may restrict innovative practices that would reduce impervious cover. These "rules" refer to a mix of subdivision codes, zoning regulations, parking and street standards and other local ordinances that determine how development happens (Center for Watershed Protection, 1998). These rules are often responsible for wide streets, expansive parking lots and large-lot subdivisions that reduce open space and natural features. Additionally, community perception of LID may slow its implementation. Many homeowners claim to want large-lots and wide streets and view reduction of these features as undesirable and even unsafe. Furthermore, many people believe that without conventional controls, such as curbs, gutters and end of pipe basins, they will be required to contend with basement flooding and subsurface structural damage. ***We must all work to dispel these misconceptions and remove these barriers so that LID can flourish in southwest Michigan.***

Future Issues of this newsletter will address:
What local government can do to promote LID and examples of LID in southwest Michigan.*

*If you know of a LID project in southwest Michigan, please contact: **Marcy (269) 925-1137 x25 colcloughm@swmpc.org**. For more information or questions, please visit these websites or contact the watershed coordinators:

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.allegancd.org/gun-river
Paw Paw River Watershed: Matt Meersman (269) 925-1137 x22 www.swmpc.org/pprw.asp

See more on LID at www.swmpc.org/LID.asp

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