



The Urban Review

Sediment & Erosion Control Information Newsletter

Low Impact Development: A lot-level approach to stormwater man-

Low Impact Development (LID) is a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds. It is an approach that uses various planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID is an ecologically friendly system of stormwater management and site development that still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.

Undeveloped land allows a large portion of stormwater to seep gradually into the ground, removing pollutants, and recharging groundwater aquifers. As areas become developed, more rain water lands on impervious surfaces such as roofs, sidewalks and streets, and must be controlled through stormwater management techniques. Local building codes often require that developers use gutters and piping systems to carry rain water into ponds or detention basins. As new regulations attempt to address water quality, erosion, and flow volume the cost and complexity of these types

of engineered systems has increased.

Low Impact Development strategies work to allow natural infiltration to occur as close as possible to the original rainfall area. By engineering terrain, vegetation and soil features costly conveyance systems can be avoided and the landscape can retain more of its natural hydrological function. Builders can often combine green building and LID concepts to lower



Infiltration islands in parking lot

actual development costs. Most surface pollutants are picked up during the first one-half inch of rainfall. Many traditional conveyance systems require specially designed basins to filter this “first flush”. LID design principles can be used as buffers to filter out pollutants before they reach streams and aquifers.

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Water Quality Trading

New Ohio Environmental Protection Agency (OEPA) rules (OAC 3745-5) were adopted December 15, 2006 for water quality trading, creating a viable market based alternative to achieving water quality goals within watersheds. These new rules allow trading of defined water quality pollutant units among point sources and non-point sources. The intent is to provide an economical alternative to the high cost of pollutant reduction associated with more advanced treatment.

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Most of the initial water quality trading programs have focused on nutrients, such as phosphorus and nitrogen, generated from publicly owned treatment works (POTWs) and industrial sources. However, any quantifiable pollutant that causes impairment within a watershed could be used for developing credits. There is increasing interest in trading sediment runoff, biological oxygen demand (BOD),

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Low Impact Development (continued from page 1)

LID Goals

- Preserve open space and minimize land disturbance
- Protect and incorporate natural landscape features into site designs
- Decentralize and micromanage stormwater at its source
- Reexamine the use and sizing of traditional site infrastructure and customize site design to each site

Low Impact Design Strategies

The basic practices work to keep rainwater on site, slowly release it, and allow for natural physical, chemical, and biological processes to do their job. Practices include:

Bio-retention cells provide storage area for runoff to collect and filter gradually into the soil. They include detention/retention basins and rain gardens. They capture pollutants and gradually discharge water over a period of time.

Vegetated swales, buffers and filter strips act as alternatives to curbs and gutters. They capture runoff from impervious surfaces and use grass or other vegetation to reduce flow velocity and allow filtration, while channeling high volume flows safely away.

Cistern collection systems store rainwater for later use. They may be a simple rain barrel on an individual lot or an extensive system installed directly under pervious pavement that allows maximum storage capacity.

Disconnected impervious areas direct flows from rooftops and pavement into separate individual deten-

tion cells instead of traditional drainage conveyances.

Decreased road and pavement surfaces prevent the generation of runoff and reduce the amount of water that needs treatment.

Vegetated roofs or “green roofs” intercept and store rain water releasing it over a long period of time. They conserve energy by reducing heating and cooling needs, reduce “thermal shock” caused by flash runoff from hot roof surfaces, and they last longer than conventional roofs.

Site design strategies include decreasing impervious surfaces and planning site layout to retain more of the land’s natural hydrology. Site layouts that consider natural resource preservation and cluster homes on slightly smaller lots will allow more preserved open space. Grading to natural contours can reduce earth moving and infrastructure costs while retaining more of the natural hydrology.

Because of its emphasis on natural processes and micro-scale management practices, LID is often less costly than conventional stormwater controls while adding value to the landscape. Additional time and money invested in the initial planning stages of development are vital to the success of a project. Careful integration of LID practices can be less expensive than integrating drainage and piping for retention basins, etc. The increased up-front costs are often recouped by rapid home sales, enhanced marketability and higher lot yields. At the same time, because natural filtration methods are used, runoff pollution is reduced, resulting in less pollution of waterways. Other benefits include habitat enhancement, flood control, drought impact prevention and urban heat island effect reduction.

CPESC Professional Certification

This year, during the Expo, we will host an exam review course for professional certification by CPESC. Registration is separate for this day long course. Cost for the 8 hour review course is \$120 and is payable to Franklin SWCD. Download a registration form at www.scexpo.org and send it, with fee, to Franklin SWCD at 1328 Dublin Road, Suite 101, Columbus, OH 43215. Lunch and course materials will be provided.

To become a Certified Professional in Erosion and Sediment Control one must pass an extensive examination to assess knowledge, skills and experience. The next exams in central Ohio will be held on March 9th in Columbus and on April 20th in Masillon, Ohio. Check out the CPESC website www.cpesc.org for more information on applying for certification and registering for the exam.

5th Annual Stormwater and Erosion Control Expo



The 5th Annual Central Ohio Stormwater and Erosion Control Expo will be held on April 4th, 2007 at the Eastland Career Center in Groveport. The Expo brings together stormwater and erosion control professionals and community leaders to explore more efficient and effective ways to reduce the impacts of construction site runoff, meet Ohio EPA requirements, and improve storm water management throughout Central Ohio. Seminars, discussions, and outdoor demonstrations will be held throughout the day.

Join us for a presentation on permeable concrete by Warren Baas, V.P. of Ohio Ready Mixed Concrete Assoc., then Scott Sonnenburg, P.E., L.A. of Eco-Design and Engineering will show how LID principles can be incorporated into large commercial designs. The Army Corps of Engineers will discuss permitting and Chad Lucht, CPESC from Fairfield SWCD will go over the construction plan review process. Outside demonstrations will show installation techniques and uses of the newer products and technologies. You'll have time to visit with the vendors, check out the exhibits, and network with other professionals. After lunch Katherine Fontaine, Jennifer Conroy, P.E. and Chris Everett, CPG from Burgess & Niple and Scott Doran of VSSP will talk about current issues in stormwater regulation and the Big Darby Stormwater Permit.

Cost to attend the event is \$20 per person and includes lunch from City BBQ. **Registration forms are available at www.scxpo.org along with additional information on speakers and the agenda.** We will be happy to provide documentation for Professional Development Units for those attending the Expo. Sign-in is from 8:30 to 9:00, programs begin at 9 a.m. and will end at 2 p.m.. Hope to see you there!

FYI

The USDA has expanded the quarantine for Emerald Ash Borer (EAB) to include the entire states of Ohio, Indiana and Illinois. Under a signed Executive Order, Governor Taft has authorized a quarantine within Ohio to prevent the spread of EAB by making it illegal to move ash trees, parts of an ash tree including branches, bark and wood chips, and all hardwood firewood out of quarantined areas. In Franklin County the quarantine area is within I-71, I-70 and the Licking and Delaware County borders. Violators face fines of up to \$4,000.

Water Quality Trading (continued from page 1)

and temperature. Within Franklin County, phosphorus and sediment loading are the primary causes of non-attainment for watersheds. Future trading opportunities and extended markets may exist among regions as large-scale solutions to issues such as hypoxia in the Gulf of Mexico and CO₂ emissions and the existing carbon market.

The ongoing OEPA Total Maximum Daily Load (TMDL) program will drive the need for pollutant reduction alternatives as watershed goals are defined and as development continues within watersheds. A TMDL establishes a cap on the allowable loading of pollutants and is allocated across point sources and non-point sources within a watershed. A trading market among these varied sources creates an incentive to over-implement low cost best management practices (BMPs) for large areas of the targeted watershed thus

decreasing and improving the overall pollutant loading within watersheds.

The economic benefits of a water quality trading market are achieved through the reduction in the overall cost of water quality objectives through the economies of scale and the variability of treatment efficiencies. This broad based approach to watershed management will engage more non-point sources in solving water quality issues and encourage further adoption of pollutant prevention, create markets for the innovative technologies, and foster a continued dialog while creating incentives for water quality improvements among watershed stakeholders.

Resources:

http://www.epa.state.oh.us/dsw/rules/prop_WQ_trading_oct06.html
<http://www.epa.gov/owow/watershed/trading/handbook/index.html>
<http://www.epa.state.oh.us/dsw/tmdl/index.html>



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BMP Review: Dewatering

The Ohio EPA prohibits any turbid discharges to surface waters of the state resulting from dewatering activities. Yet dewatering an area is often necessary during the course of construction when water prevents work from proceeding. This water often has large quantities of suspended sediments and must be treated. *Clean* ground water that does *not* contain sediment or other pollutants is not required to be treated prior to discharge. However, care must be taken to ensure that it does not pick up sediment by crossing exposed soils.

All sediment laden discharges must pass through a practice to remove the sediment load. A vegetated filter area may be sufficient for some situations but many will need extra treatment such as sediment traps,

filter bags, or flocculation. Note that any turbid discharge to a stream resulting from dewatering activity is a violation of the Ohio Revised Code. Therefore, it may be necessary to utilize more than one method to fully treat turbid water.

Densely vegetated areas may be adequate to treat short duration discharges if flow is not channelized directly to a waterway allowing slow overland flow and settling. A minimum of 100' is needed when using a vegetated area. Dense grass or areas with natural depressions work best. Critical areas like wetlands should never be used.

In most cases water should be directed to a sediment trap where the silt can settle out prior to discharging to waters of the state. Sediment traps should have sufficient storage to

receive all the water discharged from pumping and retain it for at least 24 hours.

Geotextile filter bags may be used. They are single use products that must be replaced when they become half full of sediment or clogged. They should not be placed in close proximity to the waterway and they must sit on a relatively flat grade so the water leaving the bag does not cause any additional erosion. And they should be used in conjunction with a large vegetative buffer or a secondary pond or barrier.

In all cases pumping should draw from the surface of the impoundment. Drawing water from the floor of the area will draw in the muddiest water and increase the amount of sediment that must be removed.

Connecting People with Natural Resources