

CONSERVATION *Showcase*



Loess Hills Residential Development Retains Rain

A one-of-a-kind residential housing subdivision called Woodfield is developing in southwest Iowa, near Glenwood, along the Loess Hills Scenic Byway, which minimizes soil disturbing activities during construction and permanently manages storm water to protect water quality with low impact development (LID) practices that infiltrate water on-site.

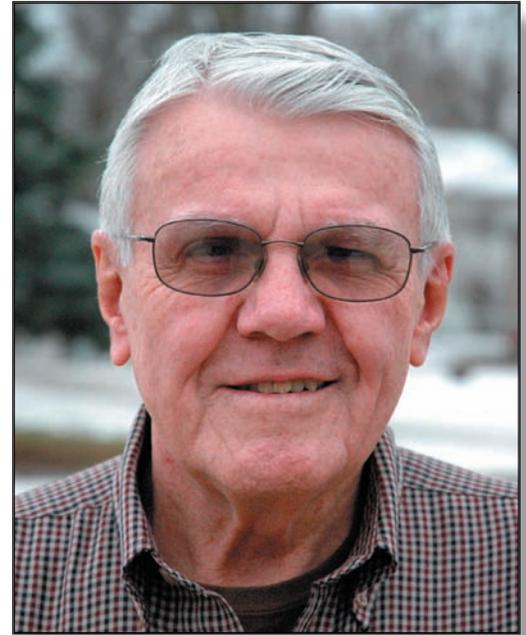
LID is an ecologically friendly approach to land development and storm water management. This approach emphasizes site design and planning techniques that retain water on-site and mimic the natural infiltration-based, groundwater-drive hydrology of our landscape.

Alfred and Brenda Beier purchased the 175 acres of rugged, overgrazed, highly erodible loess hills pasture in 2000. Later, the Beiers invited Ed and Ruth Cambridge to form the investment team Oak Ranch Development. They are developing Woodfield in four

phases. The first phase is underway, which includes 20 acres in lots for 42 homes and 20 acres of open green space.

Minimal Disturbance

To minimally disturb the loose, crumbly loess soil, Woodfield is designed in a way opposite



Ed Cambridge

of how typical residential subdivisions are developed. Instead of grading the entire site, building homes, and then planting and seeding trees, shrubs and grass last, the development team designed Woodfield to fit the existing landscape to reduce the amount of grading needed and land exposed to erosion.

Wayne Petersen, urban conservationist with the USDA Natural Resources Conservation Service, says phased grading is important because it opens up only a portion of a site at one time. "Grading is completed, vegetation is seeded, and erosion control practices are in place before the next phase of grading is started," he says.

Woodfield lots are located on hilltops, roads are placed on the contour and erosion-reducing agricultural conservation practices such



Homes in Woodfield are located on hillsides and ridges, leaving rugged terrain below as open space filled with native grasses and trees. Notice that terraces, once built to reduce soil erosion on agricultural land, were kept in place. (Photo by Jason Johnson, USDA-NRCS)

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as terraces are left alone, when possible. Additional trees, bushes and native grasses were planted and seeded in 2002, five years before the first home was constructed, to provide vegetative cover, windbreaks and privacy.

Cambridge says it is his goal to show other developers and investors that infiltration-based, low impact developments are not only environmentally-friendly, but economically feasible. “There is certainly less grading and less long-term maintenance involved [with low impact developments],” says Cambridge.

Rich Maaske, an urban conservationist with the Iowa Department of Agriculture and Land Stewardship-Division of Soil Conservation (IDALS-DSC), has worked in the Loess Hills region for more than 30 years. In the last ten years he has seen several conventional residential developments go up in the Loess Hills, each creating storm water management and erosion control problems.

“Counties, cities and developers need to pay close attention to how and where developments go in the Loess Hills,” says Maaske. “The Loess Hills are beautiful when they are



About 20,000 feet of pervious walking trail is planned for the entire Woodfield subdivision. A geo-web vinyl grid lies on top of a geo-web fabric. The grid holds open grated rock in place. The trail will infiltrate storm water runoff. (Photo by Rich Maaske, IDALS-DSC)

stable with cover on them. When there is a development in the Loess Hills, low impact development and minimal disturbance should be the standard. Green sells. Brown doesn't.”

LID Practices

Most subdivisions are “curb and gutter”, where rainwater flows to storm sewers to be flushed into our streams and rivers, along with pollution from roads and yards. In contrast, the goal at Woodfield is to direct water to infiltration-based storm water management practices where it is absorbed on-site.

“Here, we want to hold the water on-site, and we very seldom have water leaving the site,” says Maaske.

One of the most visible Woodfield LID practices is grass swales, which replace storm sewers. The grass swales were seeded with a compost blanket. High levels of organic matter in compost absorb rain and help retain water on-site. Swales are flatter than a typical road ditch with a grade of less than 1.5 percent to prevent gully erosion. Roads were built on the contour and direct water to the roadside grass swales.



One of the most distinctive storm water management practices at Woodfield is grass swales, which substitute for traditional storm sewers. The swales were seeded with compost to absorb water. To prevent erosion until vegetation is established, compost socks were applied. (Photo by Rich Maaske, IDALS-DSC)

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Other LID storm water management practices at Woodfield include:

- Native Landscaping – About 30 acres of the entire 175-acre Woodfield development is native plants, with a root system that holds water like a sponge.
- Pervious Walking Trails – Phase one includes 6,000 feet of rock walking trails, built on the contour, with a four-inch base of geo-grid that absorbs storm water runoff.
- Infiltration Trenches – Woodfield currently features two infiltration trenches. These are excavated trenches backfilled with a coarse stone aggregate and organic matter allowing temporary storage of runoff. They help surface runoff infiltrate into the surrounding soil.
- Rain Gardens – Rain gardens will be built and promoted by Oak Ranch Development. These are concave gardens featuring native vegetation strategically located to capture runoff from roofs, driveways, patios, and streets.
- Permeable Paving System – A few homes at Woodfield will feature special driveways with modular concrete paver blocks. This

system allows water to infiltrate into soil and groundwater below substructure layers of limestone.

To help offset the cost of LID practices, Oak Ranch Development received a grant in excess of \$300,000 from the IDALS-DSC Watershed Protection Fund. “Rich (Maaske) approached me early on about the development, and then he initiated the state grant,” says Cambridge. “Without the grant, we wouldn’t have been able to do the pre-construction plantings or walking trails.”

To learn more about low impact development, call Rich Maaske in the West Pottawattamie SWCD office at (712) 328-2489 or Wayne Petersen with USDA-NRCS at 319-337-2322.

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*Jason Johnson, Public Affairs Specialist
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Streets are one of the few impervious surfaces at Woodfield. To capture storm water runoff from streets, a road tube outlets water to compost-seeded Filtrexx SoxTM that reduce flow to a temporary sediment basin. There is now a permanent infiltration trench below the Filtrexx SoxTM. (Photo by Rich Maaske, IDALS-DSC)