

a natural storm water system

Ford Rouge Center will be a world-class workplace where innovation will thrive

Of all the environmentally inspired innovations at the Ford Rouge Center, the 10.4-acre living roof (see photo) receives the most attention. But the living roof is just one part of an extensive storm water management system now being installed near the new Dearborn Truck Plant. The system uses natural methods to catch and clean storm water runoff.

The problem of runoff

When precipitation falls on industrial sites, it lands on mostly hard surfaces. The storm water scours dust and dirt from factory roofs, roads and parking lots and within minutes, the unfiltered water runs off into nearby rivers and lakes. This impacts water quality.

A challenging site

The Rouge is not an easy place to manage storm water runoff. Back in 1917, Henry Ford built the complex in a low-lying area with poorly draining soil. Over the years, storms have flooded Rouge factories and caused production delays. In addition, the



new Dearborn Truck Plant and the buildings surrounding it occupy nearly two million square feet of land, which leaves little space to construct a conventional water treatment plant.

The problem with treatment plants

Water treatment plants are expensive to build and operate.

They require acres of space, use lots of chemicals and energy, and can create unpleasant odors.

So Ford engineers looked for a better way to handle the millions of gallons of storm water that fall on the Rouge site annually.

An innovative solution

Instead of a chemically-based storm water treatment plant, Ford designed a system that mimics nature.

The living roof atop the final assembly building uses a groundcover called sedum to absorb most of the rain and snow falling on its surface. At ground level, porous pavement on the shipping lot soaks up and filters rain before it runs off. A network of under-

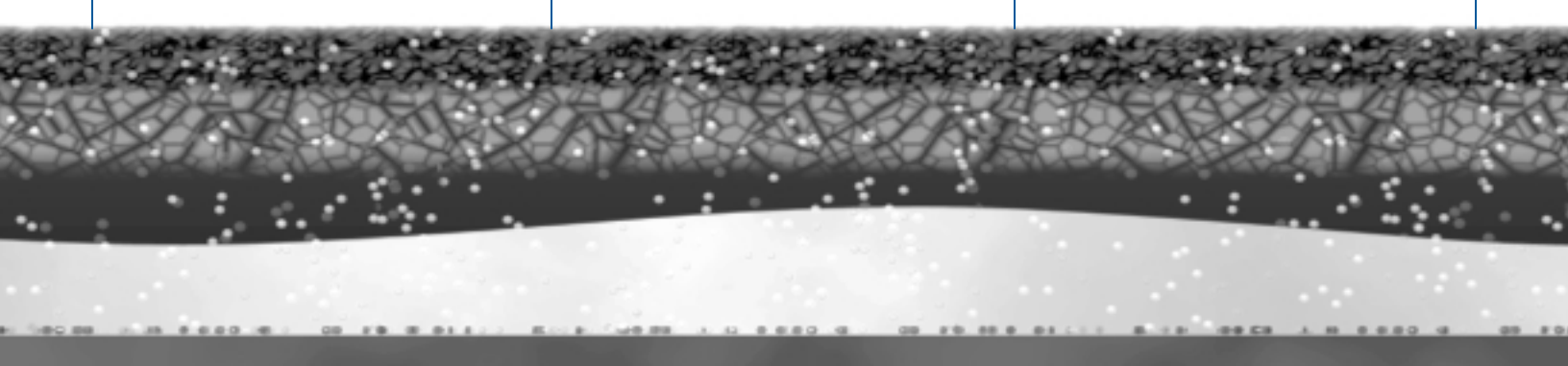
“The new storm water management system we’re installing uses natural processes to clean runoff before returning it to the watershed. We hope it serves as a model for other large industrial sites because water conservation and water quality are among the most important environmental issues of the 21st Century.”

*Tim O'Brien
Vice President
Corporate Relations*

ground storage basins, natural wetlands, and vegetated ditches (called swales) filter and aerate storm water without using chemicals.

When fully developed, this system will significantly reduce the amount of storm water leaving the site and entering the Rouge River watershed. It will filter dirt particles, add oxygen to rivers and lakes, and prevent major flooding—at one-third the projected cost of building a conventional water treatment plant.

Porous paving lets rain trickle down through gravel and into stone storage basins to filter out particles from the water.



How does the system reduce runoff?
 Ford's natural storm water management system reduces water volume in four ways. First, sedum on the roof—as well as vegetation in the swales and treatment wetlands—absorbs water as nourishment. Second, some water evaporates into the air during photosynthesis. Third, rain seeps into the ground wherever there is green space and porous pavement at the Ford Rouge Center. And fourth, more evaporation occurs as water flows through the wetlands and swales.

How does it clean storm water?
 The living roof and porous paving act as filters, sifting dust and dirt out of storm water. Further filtering occurs as storm water is channeled through the thick roots of plants in the treatment wetlands and swales, as well as through stone filtration beds located underneath the porous pavement lots. Water rippling through wetlands and swales acquires oxygen, making it healthier for the fish and other aquatic life in nearby rivers and lakes.

How does porous pavement work?
 Porous pavement is honeycombed with tiny holes that allow rainwater to trickle down through gravel and stone storage beds under the paving, which filter out particles.

A porous pavement test lot installed near the Dearborn Assembly Plant is being studied to measure how well this system also reduces standing water, cuts the cost of winter maintenance, and improves traction.

Currently, the world's largest porous

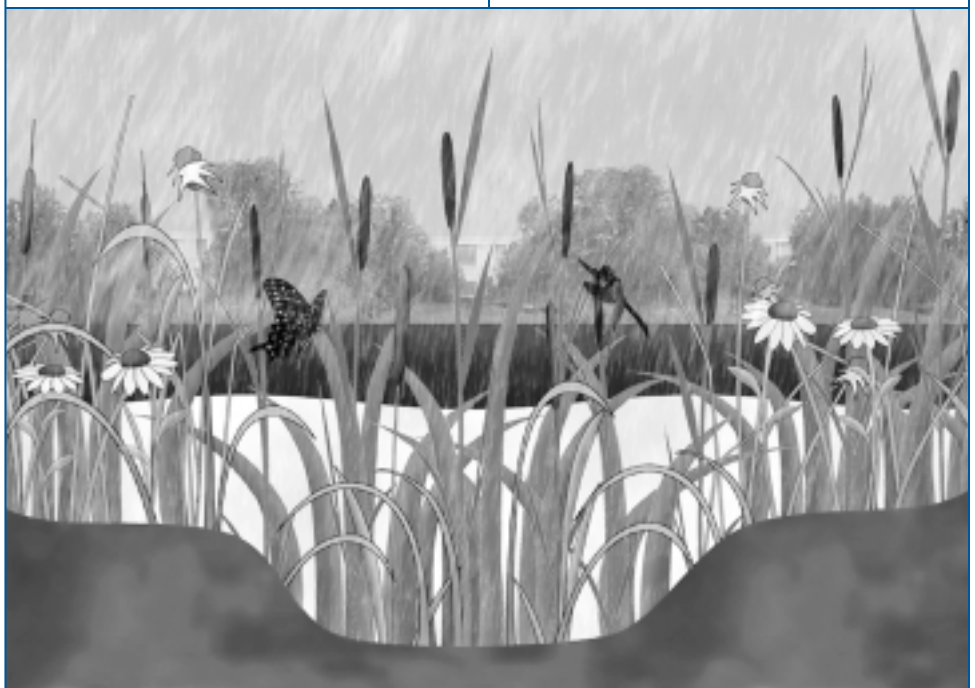
pavement lot is under construction at the vehicle shipping yard northwest of the Dearborn Truck Plant. Covering over 16 acres, this lot is being built over large stone storage basins that slow down the rush of storm water, as well as filter particles from it.

Has Ford set performance targets?
 When fully developed, Ford's natural storm water management system will significantly reduce the amount of storm water leaving the site. Also, the system is expected to reduce suspended solids by at least 85 percent, and reduce bacteria levels in the water. The new system is designed to protect against water damage, even from a rare 100-year flood event.

How big are the cost savings?
 For a site as large as the Ford Rouge Center, a conventional storm water treatment plant would cost up to \$50

million to construct. In addition, the plant would cost hundreds of thousands of dollars to operate annually. The natural system being installed around the Dearborn Truck Plant will cost one-third that amount, and have virtually no operating costs.

Does a natural system provide any other benefits?
 Together, the living roof, swales and natural treatment wetlands add many acres of green space to the Rouge site. Dozens of plant species like New England aster, prairie cone flower, Indian grass, and great spike rush beautify the landscape, trap airborne dust, create oxygen, absorb carbon dioxide, and reduce the urban heat affect caused by acres of paved surfaces. A natural storm water treatment system like this one also provides food and shelter for birds, insects, and small animals.



Swales and treatment wetlands catch and clean storm water runoff naturally.

