

Bad drainage can kill your roads



This road looked fine, but there was trouble brewing underground. Water travelling outside the culvert opened a six-foot high cave under the pavement that the soil had bridged until this last pass.

Engineers estimate that at least 90 percent of a road's problems are caused by water. The top three ways to preserve your roads' strength and extend their life are:

1. Drainage
2. *Drainage*
3. **Drainage**

Why? Water weakens base materials. They shift under loads, causing damage to the surface. Water in pavement causes cracking and potholes. Yet, because most drainage systems are underground, they are often neglected. Make sure you are getting water away from the road by inspecting and maintaining your culverts, ditches and storm sewers.

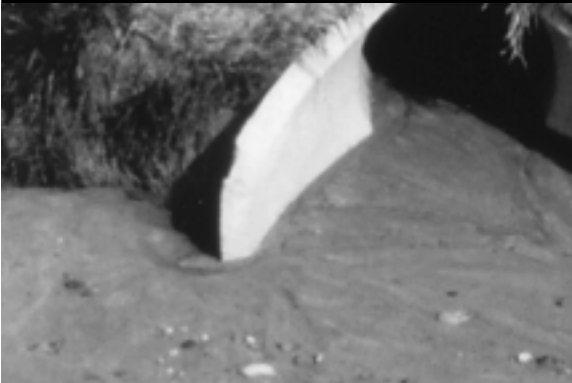
When? Inspect culverts and open drainage systems every spring and fall. Inspect and clean catch basins every year and inspect storm sewers before any road work. You can use the WisDOT inventory form for culverts. Most communities will have to hire a contractor with a camera setup to inspect storm sewers.

Inspect drainage systems one to two years before any road or utility improvements are planned. This allows you to correct drainage problems as part of the work and ensures that new work won't be ruined by old water problems.

What? Look at the road, the waterway, the ends, and the barrel. Keep an inventory with ID number, location, type, age, description, and repair history. With closed systems also look at inlets, manholes, catch basins, and outfalls. Water running through storm sewers during dry weather can mean an illegal sanitary sewer connection or a nearby water main or service leak.



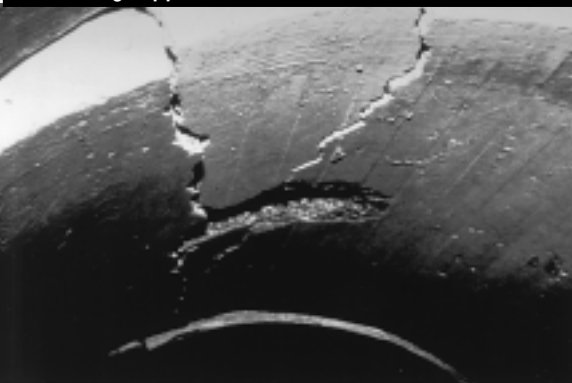
The road has been patched, but the real problem is a failing culvert.



Erosion has half-filled this culvert end with soil and is scouring away supporting soil alongside.



Water running outside a culvert washed away soil, weakening support for the culvert and the road.



Poor support on the sides of this culvert allowed overhead loads to crack it.

Road. Any change at all?
A sag? Transverse or other cracks?
Sideslope failure? Excessive patching?

Waterway. Any scouring at the end of the pipe? In-filling in the pipe or at its end? Catching of debris? Is the culvert still lined up right? What about high water marks and changes in the drainage area? Is the culvert still the right size? Is there standing water in the culvert or ditches?

Ends. Have they moved? Settled? Cracked? Has the water undermined them? Scoured into the streambed? Seeped along the outside? Created holes by removing soil? Are headwalls sound?

Barrel. Flexible pipe: Has the shape changed? (Measure and replace if it has deformed more than allowed by WisDOT or manufacturer standards.) Rigid pipe: Are joints and seams sealed? Is there pitting? Cracking? Spalling?

Culvert inspection was covered in the T.I.C.

Drainage Maintenance workshops held last December. A few copies of the workshop materials, including the WisDOT culvert inspection form, are still available. Call the T.I.C. at 800/442-4615, or write or fax using the form on page 7.

*Some of this information comes from **How to Inspect Your Culverts**, published by the Vermont Local Roads News, June 1993.*

METRIC ANSWERS

(From page 8)

- 1) kilogram, kg
- 2) hectare, ha
- 3) newton, N
- 4) pascal, Pa

- 1) 115.2 mm
- 2) 2.65 L
- 3) 10 000 kg

(Because other countries use a comma where we use a decimal point, the new standard is to use spaces to separate groups of three digits in large numbers.)

- 4) 0.4525 m or 452.5 mm

(The WisDOT standard is to use meters and millimeters, not centimeters.)