

Just for street and road workers

Editor's note: *The two articles on pages 6–8 are the latest in a series based on information in Iowa's new Local Roads Maintenance Workers' Manual. The manual was developed by CTRE and sponsored by the Iowa Highway Research Board (TR-514). The series began with the July–August 2006 issue of Technology News. Previous topics included maintaining gravel roads and identifying/repairing asphalt pavement distresses.*



Iowa One Call: It's the Law

Iowa law requires that anyone planning any form of excavation must contact the Iowa One Call notification system (1-800-292-8989) at least 48 hours in advance so that utilities can be located and marked. Always consult your supervisor before conducting any excavation like mud jacking and full-depth repair.

Rule of Thumb

Always check with your supervisor and follow your agency's policies and procedures for identifying distresses and performing maintenance or repair work.

Identifying concrete pavement distresses

Properly maintaining and repairing portland cement concrete (PCC, or simply concrete) pavements helps prevent, delay, and/or reduce the severity of distresses that can result in pavement deterioration. Random cracks, for example, can allow water to infiltrate the pavement base and subbase, potentially decreasing the pavement's load-carrying capacity. Some distresses grow, leading to pavement deformation and surface damage.

Every jurisdiction should have a system in place for regularly identifying distress(es) needing repair.

Cracks

Random cracks can occur in concrete pavement for many reasons:

Transverse cracks run across the pavement, perpendicular to the shoulder. Longitudinal cracks run parallel to the shoulder. These cracks may occur if joints are not sawed at the right time and in the right places to adequately relieve stresses in the restrained concrete due to drying shrinkage, curling and warping, etc.

D cracking occurs at slab corners where longitudinal and transverse joints intersect. The failure is due to poor quality aggregate in the original concrete mixture.

Map cracking is a pattern of interconnected random cracks that indicates the surface was over-finished or inadequately cured.

Joint deterioration/spalling

Joint deterioration like spalling is caused when water and/or debris in the joint freezes and expands, putting pressure on the concrete along the joint (figure 1).

Blowups

When concrete expands during hot weather, pressure can build up in the concrete along the joints until the panels rise at the joints and shatter. Blowups can be quick and violent, throwing pieces of concrete several feet.

Scaling

Scaling is the deterioration of the upper 1/8- to 1/2-inch of the concrete surface. It may be caused by deicing chemicals or inadequate curing.

Pavement settlement

Slabs sometimes settle, particularly bridge approach panels. Settlement generally indicates that subbase materials have migrated from beneath the slab.

Faulting

Faulting is a difference in elevation across a joint or crack caused by slab settlement on one or both sides of the crack/joint or by rocking of the slab at the crack/joint as traffic moves across it.

Pumping

Pumping is the seeping or ejection of water and subbase material from beneath the pavement through pavement cracks under heavy loads. Sometimes deposits of fine material are left on the pavement surface or stain it.

Corner breaks

A corner portion of the slab may separate along a crack that intersects adjacent transverse and longitudinal joints. Corner breaks can occur if loads are allowed on new pavement before it has gained adequate strength or where the subbase material is not uniform or has eroded away.

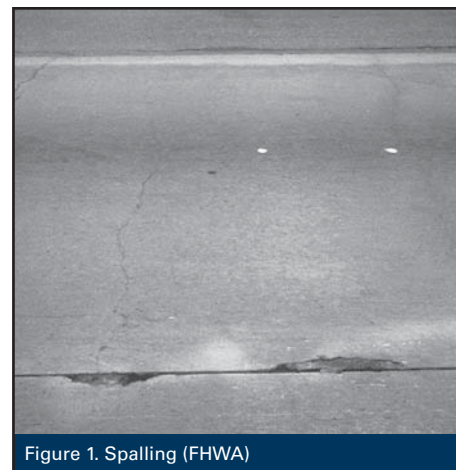


Figure 1. Spalling (FHWA)