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## Sealed Edge Joints Minimize Water Intrusion

**E**xcess moisture is the primary cause of road deterioration, and is responsible for reduced strength in the system and reduced load-carrying ability in the pavement layers.

The Minnesota DOT's Minnesota Road Research Section facility north of St. Paul perhaps is one of the most ambitious test tracks in the world in its continuous collection of environmental data.

MnROAD research for Drainage of Pavement Base Material: Design and Construction Issues (Roberson, Birgisson) tested a section consisting of edge drains that were introduced into a dense-graded base material to simulate retrofitting of pavements, and a section involving a traditional edge drain design.

Neither system drained at optimum performance. The research indicated that edge drains for dense-graded bases (the first case) may not assist the flow of water through the pavement system in a significant manner. For this reason, the research recommended that the practice of retrofitting existing pavements with drainage schemes be reconsidered.

For the second case (the typical configuration), the research indicated that the drain may have been affected by inadequate compaction of the soil over the edge drain. The authors noted their experience emphasized the need to review the use of edge drains and to scrutinize the materials and techniques that go into the construction of edge drains.

For Edge-Joint Sealing as a Preventative Maintenance Practice, MnROAD's Roberson and Olson examined two similar concrete test sections with bituminous shoulders and edge drains. One of these sections acted as a control and did not have its longitudinal edge joint — the joint between the shoulder and the pavement — sealed.

Before sealing the [second] test section, the two sections were monitored and found to have no significant differences in the volume of water drained. The test section was then sealed, and both sections were again closely monitored, and found the total volume of water entering the pavement system for a rain event was reduced by as much as 85% through the use of an edge seal. For this reason, the research held that the edge joint seal should become standard practice in preventative maintenance for pavements.