

Understanding Corrective, Preventive Repair Techniques

Concrete pavement preservation or restoration techniques fall into two general categories: corrective and preventive activities. This article spotlights five techniques that can be used as both corrective and preventive techniques.

Diamond Grinding - Diamond grinding improves a pavement's ride by creating a smooth, uniform profile by removing faulting, slab warping, studded tire wear, and patching unevenness. This extends the pavement's service life by reducing impact loadings, which can accelerate cracking and pumping. Diamond grinding's corduroy-like texture also decreases undesirable noise, improves skid resistance, and corrects poor drainage caused by inadequate slope. Correcting skid resistance and drainage reduces the pavement's hydroplaning potential. For more information on diamond grinding, see ACPA publication *Diamond Grinding and Concrete Pavement Restoration* (TB008P).

Dowel-Bar Retrofit - Dowel-bar retrofit increases the load transfer efficiency at transverse cracks and joints in jointed concrete pavements by linking the slabs together so the load is distributed evenly across the joint. Improving the load transfer increases the pavement's structural capacity and reduces the potential for faulting by decreasing the stresses and deflections in the pavement. Dowel-bar retrofit consists of cutting slots in the pavement across the joint or crack, removing the concrete cleaning the slot, placing the dowel bars, and backfilling the slots with new concrete. For more information on dowel-bar retrofit, see ACPA publication *Guide for Load Transfer Restoration* (JP001P).

Slab Stabilization - Slab stabilization restores support to concrete slabs by filling small voids that develop underneath the concrete slab at joints, cracks, or the pavement edge. The voids, often not much deeper than 3 mm (1/8 in.), are caused by pumping or consolidation of the subgrade from high corner deflections. Without proper support, the pavement may develop faulting, corner breaks, and extensive cracking. This procedure is sensitive to construction practices, so care must be taken when performing slab stabilization. For more information on slab stabilization, see ACPA publication *Slab Stabilization Guidelines for Concrete Pavements* (TB018P).

Cross-stitching - Cross-stitching repairs longitudinal cracks that are in fair (low-severity) condition. It increases load transfer at the crack by adding steel reinforcement to hold the crack together tightly. This limits the crack's horizontal and vertical movement and prevents it from widening. Cross-stitching is not an alternative for cracks that are severely deteriorated or functioning as a joint. At severely deteriorated cracks, there is too much deterioration to reestablish effective load transfer. Cross-stitching transverse cracks that are functioning as joints may restrain the pavement and may cause a new transverse crack to form. In these cases, dowel-bar retrofit is a better CPR technique. For more information on cross-stitching, see ACPA publication *Joint and Crack Sealing and Repair for Concrete Pavements* (TB012P).

Grooving - Grooving restores skid resistance to concrete pavements. It increases the surface friction and surface drainage capabilities of a pavement by creating small longitudinal or transverse channels that drain water from underneath the tire,

reducing the hydroplaning potential. On airfield pavements, grooves are typically oriented in the transverse direction, while on highway pavements, the grooves are usually longitudinal.

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