ALLIED CONCRETE Co.

CONCRETE TIP #3

SCALING ON CONCRETE SURFACES

Scaling occurs when freezing and thawing causes the finished concrete surface to flake or peel off. Light scaling does not expose the coarse aggregate. Moderate scaling involves the loss of 1/8" to 3/8" of the surface mortar and exposes the aggregate. Severe scaling leaves the aggregate clearly exposed.

Why Scaling Occurs

- Use of non-air-entrained concrete
- Application of calcium or sodium chloride deicing salts
- Finishing concrete while bleed water still on surface
- Insufficient curing

What to Do About It

To repair severely scaled surfaces, make sure it is free of dirt, oil or paint. The repaired surface will only be as strong as the base surface to which it is bonded, so it may be necessary to use a hammer and chisel, sandblasting or a jackhammer to remove weak or structurally unsound material. Apply a new surface using either Portland cement resurfacing or latex modified concrete resurfacing mixtures. To prevent scaling from occurring, take the following steps:

- **Use air-entrained concrete.** Air-entrainment refers to the amount of oxygen contained in a concrete mixture. For surfaces that will be exposed to severe weather conditions, freshly mixed concrete with 3⁄4" or 1" aggregate should have an air content of 6% to 7%. In moderate weather exposures where deicing salts will not be used, air content between 4% and 6% is sufficient. Air-entrained concrete with a low water-to-cement ratio and moderate slump helps produce a strong wear resistant surface.
- **Avoid deicing salts.** Calcium or sodium chloride should never be used on new or recently poured concrete. Aggressive chemicals such as ammonium sulfate or ammonium nitrate can destroy concrete surfaces when used as a deicer and should be avoided altogether.
- **Provide proper drainage.** Allowing water or a water-and-salt mixture to stand on concrete surfaces for long periods of time because of poor drainage can result in scaling.
- **Curing.** Proper curing ensures that the concrete will achieve its maximum strength. Insufficient curing often results in a weak surface skin.
- **Finishing.** Make sure that finishing operations are not started as long as surface water remains on the concrete. If bleed water is worked back into the top 1⁄4" of the slab, this will produce a weak surface layer.
- **Protect young concrete from freezing.** Freshly poured concrete should not be allowed to become saturated with water prior to the winter freeze and thaw cycle. Spray or brush on a surface sealer once the concrete is reasonably dry.

Products Used: Tamms Thin Patch; Mag De-Icer and Dust control; Visqueen Plastics and Curing Blankets; Duralflex Fast Patch.

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