

*Greening does not affect concrete performance.*

## WHAT IS “GREENING?”

Hardened concrete containing slag cement may show mottled green or blue-green areas on the surface in the first few days after placement. This temporary condition is commonly called “greening.”

## WHAT CAUSES GREENING?

The blue-green color is attributed to a complex reaction of sulfide sulphur in slag cement with other compounds in portland cement. The degree and extent of the coloration depends on the rate of oxidation, the percentage of slag used, curing conditions and the porosity of the concrete surfaces. Surface greening



*Figure 1: Greening occurred in concrete made with slag cement after forms were removed on the Canadian Chancery in Washington, D.C.*

occurs in only a small percentage of concrete made with slag cement. However, the interior of the concrete may remain blue-green indefinitely.

## GREENING AND CONCRETE PERFORMANCE

Greening does not affect concrete performance. The desired hardened concrete properties, such as strength, lower permeability and durability are not compromised if greening occurs.

*Greening does not need to be treated.*



*Figure 2: Exposure to sunlight and air allowed the concrete surface at the Canadian Chancery to oxidize and lighten.*

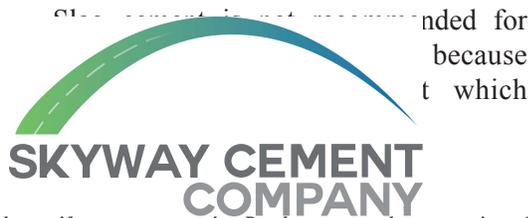
# GREENING

## HOW LONG DOES GREENING LAST?

In most concrete made with slag cement, the surface becomes light gray or white within hours after the concrete surface has been exposed to direct sunlight and air. If greening does occur, it usually appears within a week of concrete placement and typically disappears within a week, after oxidation starts.

Surface greening diminishes as oxidation progresses and does not need to be treated. Typically, surfaces showing greening will mature to a uniform light gray or white appearance. Some factors

that may cause slower oxidation rates include: extended wet curing, wet weather, cold weather, shade, continuously moist, dark environments, sealed surfaces, and/or a steel-troweled, burnished, or otherwise densified surface. It is uncommon for greening to persist after a week of exposure to dry air and sunlight.



*As with all concrete mixtures, trial batches should be performed to verify concrete properties. Results may vary due to a variety of circumstances, including temperature and mixture conditions. Nothing contained herein shall be construed as a warranty of fitness for a particular purpose.*



*Greening typically disappears within a week of initial appearance.*



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### *About the Slag Cement Association...*

The Slag Cement Association is the leading source of knowledge on blast-furnace slag-based cementitious products. We promote the increased use and acceptance of these products by coordinating the resources of member companies. We educate customers, specifiers and other end-users on the varied attributes, benefits and uses of these products.

