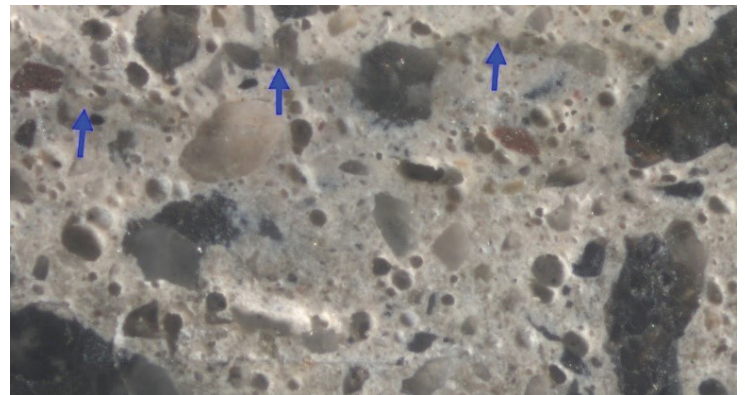
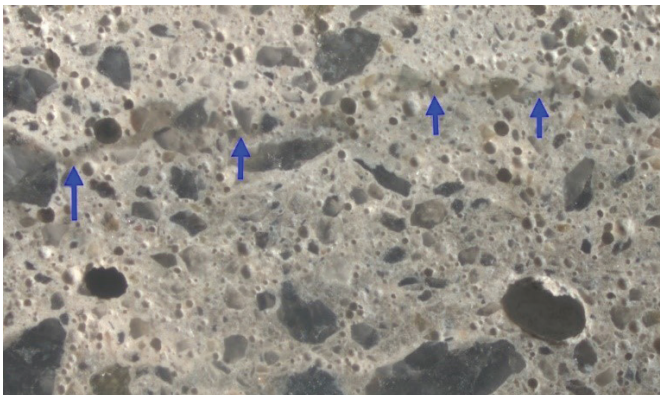




**Figure 1**  
Cores taken from scaled areas.



**Figure 2**  
Cross section of each core as viewed under the stereomicroscope. Notice the light-colored paste near the surface and the dark line (blue arrows).

## Concrete Scaling

### Determining the cause of concrete scaling

A common reason for a concrete petrographic examination is to determine the cause of scaling. The American Concrete Institute (ACI) defines scaling as “local flaking or peeling away of the near-surface portion of hardened concrete or mortar.”<sup>1</sup> In this example, two cores were taken from residential flatwork (Figure 1). The photograph on the left shows the top surface of the cores and the image on the right shows the cores in cross section.

### Evidence of Inadequate Curing

The light-colored paste near the surface and dark line just below it (blue arrows) are evidence that the concrete was not adequately cured (Figure 2). Moist curing or using a membrane curing compound keeps the surface moist so the cement can continue to hydrate and achieve an adequate compressive strength. If the surface dries out, water is not available to react with the cement and hydration stops. This can make the surface paste weak and not able to withstand freeze-thaw cycles even when the air-void system is good. This concrete was determined to have an adequate air-void system. Inadequate curing resulting in a weaker surface paste that was susceptible to freeze-thaw distress, was determined to be the cause of scaling.

<sup>1</sup>ACI Concrete Terminology (2018), American Concrete Institute, Farmington Hills, Michigan, p.57.