Portland-Limestone Cement Limits in Indiana Department of Transportation Specifications

October 2025 Update

Issue: In May 2025, in response to recent concrete bridge deck defects, the Indiana Department of Transportation (INDOT) issued a Recurring Special Provision (RSP) 901-M-069 to limit the limestone content of Type IL cement (portland-limestone cement, or PLC) to a maximum of 10% by mass. The RSP is effective for projects let on or after September 1, 2025. Representatives of the cement and concrete industry note that it:

- Disregards the specifications developed by committees of professionals at the American Association of State Highway and Transportation Officials (AASHTO) and ASTM International standards organizations
- Needlessly complicates and generates confusion through conflicting requirements
- Prevents manufacturers from effectively optimizing for best materials performance

The American Concrete Pavement Association (ACPA), the National Ready Mixed Concrete Association (NRMCA), and the American Cement Association (ACA) oppose the RSP and are pursuing a collaborative approach to address INDOT's concerns. On June 19, 2025, the groups sent a joint letter* to INDOT to request that implementation of the RSP be delayed until a comprehensive root cause analysis can be completed.

Technical considerations: The following points were raised with INDOT:

- Limestone content of Type IL cement has no correlation to scaling resistance
- The entire concrete system must be evaluated
- Admixtures are not a substitute for sound construction practices
- Frequent specification changes obscure performance evaluation
- Experience in adjacent states contradicts INDOT experience

Despite the technical considerations noted above, INDOT declined to delay implementation of RSP 901-M-069.

Status: On June 27, INDOT agreed that concrete decks would be cored to obtain samples for petrographic analysis. A task group was established to collaborate with the local industry.
Current activities include:

1. Collecting samples from INDOT- identified projects potentially affected.
2. Initiating industry research to generate technical data on INDOT mixtures and construction practices, including petrographic analyses and laboratory testing.
3. Requesting 2024 concrete bridge deck and approach projects field data to evaluate performance trends.
4. Continuing to seek INDOT data supporting specification changes in their Construction Memoranda (21-05, 22-02, 23-01, 24-03, and 25-02) which permit the use of certain colloidal silica admixtures and modify the water–cementitious material ratios and curing practices.

Formal public records requests were filed on October 13, 2025**.

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An organization of cement companies to improve and extend the uses of portland cement and concrete through market development, engineering, research, education, and public affairs work.

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Limestone Content of Type IL Cement Has No Correlation to Scaling Resistance

There is no research demonstrating a correlation between limestone content in Type IL cement and scaling resistance. Independent studies show that PLCs can perform well in standardized scaling tests. There is no reason to expect that the limit on limestone content in Type IL cement will impact the issues observed.

The Entire Concrete System Must Be Evaluated

Focusing solely on cement limestone content overlooks other critical contributors to scaling. Concrete mixture proportioning, placement, finishing, and curing practices all affect the quality of the concrete installation and establish the potential for the structure's performance in service. A rigorous, scientific investigation comparing scaled and unscaled bridge decks — placed around the same time under similar placement conditions and experiencing similar weather conditions — is necessary to determine causality.

Admixtures Are Not a Substitute for Sound Construction Practices

While admixtures may enhance the fresh and hardened properties of concrete, they are not a replacement for best practices. Using low water/cementitious ratio concrete mixtures and wet curing has been standard industry practice for decades. Forgoing proven industry best practice without substantive research and long-term field validation of new materials or methods is inconsistent with sound engineering principles.

Recent research presented at the Fall 2025 National Concrete Consortium Meeting emphasized that:

- Colloidal silica admixtures do not provide internal curing benefits;
- Colloidal silica admixtures are not capable of replacing supplementary cementitious materials in concrete at manufacturer-recommended or INDOT-required dosages.
- The impacts of colloidal silica admixtures on concrete strength and permeability are inconsistent and often fall within the normal variation of a test method.
- Colloidal silica admixtures can increase the water demand and risk of cracking, particularly when combined with an increased w/cm and a lack of curing.

Recent Specification Changes Obscure Performance Evaluation

From 2021 to 2025, INDOT issued several specification changes through Construction Memoranda (21-05, 22-02, 23-01, 24-03, and 25-02). The absence of prescriptive or performance-based criteria for colloidal-silica admixtures, along with modifying the water–cementitious material ratios and curing practices, introduces several confounding variables, complicating the ability to isolate the causes of performance-related issues, such as scaling.

Experience in Other States Raises Important Questions

The Type IL cement used in INDOT construction projects is also used in surrounding states, which are not experiencing the defects seen in Indiana. Both the Michigan Concrete Association and Ohio Concrete have published guidance on preventing scaling, emphasizing the use of proper curing and a low water-to-cementitious-materials ratio.