



Alkali-Silica Reaction Mitigation in Virginia

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ASR

Mitigation in Virginia

For the majority of aggregate sources in Virginia, what happens if we do not mitigate ASR?









ASR

Mitigation in Virginia

Based upon the research at the Virginia Transportation Research Council,
- to mitigate ASR - VDOT specifies two options for the Contractor:

1. Perform an ASTM test to determine ASR potential
2. Use a minimum amount of an approved mineral admixture

for each mix design.

ACI Concrete Mix Design Quick Reference Sheet

VDOT Road and Bridge Specifications, Section 217.02(a):

- Perform ASTM C227 with a maximum expansion of 0.15% at 56 days
- To meet this requirement, this typically requires the addition of a mineral admixture

Or,

VDOT Road and Bridge Specifications Section 217.02(a)

	Total Alkalies of Cement is less than or equal to 0.75%	Total Alkalies of Cement is greater than 0.75% and less than or equal to 1.0%
Class F Flyash ¹	20%	25%
GGBF Slag ¹	40%	50%
Silica Fume ¹	7%	10%
Metakaolin ¹	7%	10%

¹ Minimum % cement replacement by weight

Approved Mineral Admixtures

Fly Ash – Class F
Slag Cement
Silica Fume
Metakaolin

Or using a Blended Cements (still complying with previous Table)

Type IL is treated like a Type I

*** Type IP – cement blended with flyash**

*** Type IS – cement blended with slag cement**

*** may require more mineral admixture to be added**

Advantages of Using a Mineral Admixture

Cheaper than cement

Potential utilization of a waste product (other than metakaolin)

Reduce heat of hydration (less cement); reduce maximum temperature

Improves sulfate resistance

Reduces alkali-silica reaction



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Questions – addressed at the end of the presentation