

ASR: ALKALI – SILICA REACTION

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Past:

- Tested aggregates according to AASHTO T 303
- If expansion $> 0.10\%$ after 14 days in solution, considered potentially reactive and must be mitigated.

Past:

- Mitigation Methods:
 - Portland Cement with Maximum Alkali Content of 0.60%
 - Blended Hydraulic Cement
 - Portland Cement – Pozzolan Combination
 - Flyash – Maximum Alkali Content of 1.5% and 50% minimum reduction in mortar reduction when tested according to ASTM C 441
 - Use a quantity between 15.0% and 25.0% by weight to mitigate.
 - If aggregate expansion, when tested according to AASHTO T 303, is greater than 0.40%, use a minimum 20.0% flyash.

Past:

- Mitigation Methods (continued):
 - Portland Cement – Pozzolan Combination
 - Ground Granulated Blast Furnace Slag – Minimum 50% reduction when tested according to ASTM C 441.
 - Use a quantity between 25.0% and 50.0% by weight to mitigate.
 - If aggregate expansion, when tested according to AASHTO T 303, is greater than 0.40%, use a minimum 40.0% GGBFS.
 - Silica Fume
 - Use a quantity between 5% and 10% by weight to mitigate.

Present:

- All aggregate is considered reactive.
- Use the same mitigation method as in the past.

Future:

- PP-65
 - ASTM C 1293
 - Allowing 2- year prism test for evaluating preventive measures.
- Started testing all sources in 2015 (approx. 485)
- Worked with four independent labs
 - American Engineering Testing, Inc.
 - CTL Group
 - Bowser-Morner, Inc.
 - NRMCA Research Laboratory
- Testing will be complete Spring 2017

Future:

- Possible issues with high pozzolan replacement
(Levels Y & Z)

Workplan: The purpose of the study is to establish confidence that workability, finishing, strength gain, and durability are not affected by concrete mixes with varying amounts of flyash or slag as outlined in PP-65.

- Roadway
 - Sidewalk
 - Pre-cast items
- Investigate and Review until 2019
 - Planning on Spec Change for 2018 Construction Season