



American Concrete Institute

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ASR Process

Step One:

Silica in aggregates reacts with alkali in cement to produce a gel.

Step Two:

The gel absorbs water, causing expansion and hydraulic pressures sufficient to fracture and break apart the concrete.

Process Requirements:

- Sufficient moisture (80% RH).
- Reactive silica.
- Source of alkali.



Strategic Highway Research Program
Washington, D.C. 1991

The Concrete Convention
and Exposition

ASTM Proposed Language

Determine the class

Class	Acceptability of ASR	Examples
SC3	Minor Risk of ASR Acceptable	Foundations Elements Retaining Walls Large numbers of precast elements where economic costs of replacement are severe Service life normally 40-75 years
SC4	ASR Cannot be Tolerated	Power Plants Nuclear Facilities Critical Elements that are very difficult to inspect and repair Service life normally > 75 years

Water

Submittals

4.1.2.3

d. for water and ice: source of supply. When non-potable source is proposed for use, documentation on effects of water on strength and setting time in compliance with ASTM C1602/C1602M. If specified, documentation on optional requirements of ASTM C1602/1602M.

Materials

4.2.1.3 *Water and ice*—Unless otherwise specified, mixing water for concrete and water used to make ice shall comply with ASTM C1602/C1602M.

The Concrete Convention
and Exposition

NEWS.3.5 *Sawed joints*—Where saw-cut joints are required start cutting as soon as concrete has gained sufficient strength to prevent dislodgment of coarse aggregate particles. Do not saw cut reinforcement. Unless otherwise specified, saw a continuous slot to a depth one-fourth the thickness of the slab but not less than 1 in.

OLD5.3.5 *Sawed joints*—Where saw-cut joints are required or permitted, start cutting as soon as concrete has gained sufficient strength to prevent dislodgment of coarse aggregate particles. Saw a continuous slot to a depth one-fourth the thickness of the slab but not less than 1 in. Complete sawing within 12 hours after placement. If an alternative method, timing, or depth is proposed for saw cutting, submit detailed procedure plans for acceptance.



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