

ARM of Minnesota

**Exterior
Concrete
Standards**

ARM of Minnesota

12300 Dupont Avenue South
Burnsville, MN 55337

Phone: 952-707-1250
Fax: 952-707-1251
E-mail: info@armofmn.com

Revised 7-16-09



AGGREGATE & READY MIX
ASSOCIATION OF MINNESOTA

ARM Exterior Concrete Standards

Concrete

- Minimum **strength** 4500 psi at 28 days.
- Water Cementitious Ratio 0.45 Maximum.

Aggregate should conform to ASTM C33 Class 5S minimum. A better specification is MN/DOT 3137. Even then, popouts at an average density of 4 per square yard can be anticipated **for all glacial gravels found in Minnesota**. Aggregate conforming to MN/DOT 3137 Superstructure can reduce popouts to approximately 2 popouts per square yard. Aggregates conforming to MN/DOT 3137 Class A can reduce popouts to low levels.

Some crushed bedrock, such as selected limestones, has a very good performance history. These materials

can be used to substitute for Class A aggregate where the performance history is known. A popout is caused by breakdown of individual coarse aggregate particles. For the purpose of this document, a popout is greater than 1/2-inch in every direction at the surface.

Curing

A cure that provides additional water is preferred. Curing can be accomplished with a membrane forming curing compound applied at a uniform coverage rate (gal/ft²) equal to or greater than the manufacturers recommended coverage rate. **Curing Compounds shall comply to ASTM C309.**

De-icing Chemicals

De-icing chemicals should not be used on concrete less than 365 days of age. Common salt (sodium chloride) can be used after the first year. Property owners should read labels on de-icing chemicals and always avoid the use of magnesium chloride, ammonium nitrate, and sulfate salts.

Late Season Placement

Concrete placed in the fall, that will not have 30 days to dry prior to exposure to freezing, needs to be protected. After curing, the concrete should be treated with a 50/50 mixture of mineral spirits and boiled linseed oil or a siloxane, to reduce water penetration—in particular if de-icing chemicals are used before the concrete is more than 365 days of age. Scaling may occur in this condition regardless of concrete quality.

Air Content, achieved at the time and point of placement, shall conform to the following table based on the maximum aggregate size.

<u>Nominal Maximum Aggregate Size</u>	<u>Air Content (%)</u>
3/8	6-9
1/2	5 1/2-8 1/2
3/4	5-7 1/2
1	5-7 1/2

ARM of Minnesota

12300 Dupont Avenue South
Burnsville, MN 55337

Phone: 952-707-1250

Fax: 952-707-1251

E-mail: info@armofmn.com