



COLD WEATHER CONCRETE POLICY

The Village of North Aurora restricts the pouring of concrete for any public facility including, but not limited to, concrete sidewalk, driveway aprons, curb and gutter, and cast in place structures between the months of November and April. If concrete is furnished and placed between November 1st – April 1st, all pouring and curing shall be in compliance with the **Illinois Department of Transportation Standard Specifications for Road and Bridge Construction** (current edition). Click on the following link to read more about the requirements.

[Microsoft Word - Table of Contents.doc \(illinois.gov\)](#)

Documentation from a concrete testing company will be required to demonstrate compliance with the specifications outlined therein. Special attention shall be given to the cold weather procedures in the following sections (Article 1020.13 Curing and Protection, Article 1020.14 Temperature Control for Placement).

Article 1020.13 Curing and Protection. Articles 1020.13 (c) Protection of Concrete, Other than Structures, From Low Air Temperatures.

Protection of Concrete, Other Than Structures, from Low Air Temperatures. When the official National Weather Service forecast for the construction area predicts a low temperature of 32 °F (0 °C) or below, or if the actual temperature drops to 32 °F (0 °C) or below, concrete less than 72 hours old shall be provided the following minimum protection.

Low Air Temperature Forecast, °F (°C)	Minimum Protection
32 to 25 (0 to -4)	Two layers of polyethylene sheeting, one layer of polyethylene and one layer of burlap, or two layers of waterproof paper.
24 to 17 (-4 to -8)	Insulating material covered with one layer of polyethylene sheeting. The insulating material shall be according to Article 1020.13(d)(1) and have a minimum R value of 6.
< 17 (-8)	A cold weather protection plan shall be submitted, which may include cold weather adjustments to the concrete mix design, such as the heating of concrete materials.

The protective cover shall be placed as soon as possible without marring the concrete surface. The protective cover shall be secured to prevent infiltration of wind or water beneath it and shall extend over any exposed vertical edge. The protective cover shall also extend a minimum of 1 ft. (300 mm) beyond the placed concrete and shall remain in place until the concrete is at least 96 hours old. Polyethylene sheeting used for cold weather protection shall be according to Article 1022.03, except any color is acceptable.

The Contractor shall provide means for checking the temperature near the surface of the concrete during the protection period according to Article 1020.13(d)(1).

During the first 48 hours after placement of the concrete, the concrete temperature should be a minimum of 40 °F (4 °C), but shall not be less than 35 °F (2 °C). The Contractor is advised the protection specified, including the insulation R value, is an approximation for meeting the 40 °F (4 °C) minimum. The concrete temperature during the first 48 hours of placement is influenced by several factors. This includes the amount of cement and finely divided minerals in the concrete mix design, the initial concrete temperature, and how soon after concrete placement the protection is installed. Therefore, additional insulation during the protection period may be required.

Upon completion of the protection period, if the temperature differential between the concrete and the ambient air temperature exceeds 35 °F (19 °C), the concrete shall be gradually cooled to prevent thermal shock which may cause cracking of the concrete. This may consist of various methods such as removal of the polyethylene sheeting followed by a cool down period before removal of the next layer of sheeting or insulating material. Care shall also be taken to prevent thermal shock when temporary removal of protection materials is required prior to the completion of the protection period.

After September 15, there shall be available to the work within four hours, sufficient materials to cover at least two days' production. Regardless of the precautions taken, the Contractor shall be responsible for protection of the concrete placed and any concrete damaged by cold temperatures shall be removed and replaced.

Article 1020.14 Temperature Control for Placement.

(a) Concrete other than Structures. Concrete may be placed when the air temperature is above 35 degrees Fahrenheit (2 degrees Celsius) and rising, and concrete placement shall stop when the falling temperature reaches 40 degrees Fahrenheit (4 degrees Celsius) or below, unless otherwise approved by the Engineer.

The temperature of concrete immediately before placement shall be a minimum of 50 degrees Fahrenheit (10 degrees Celsius) and a maximum of 90 degrees Fahrenheit (32 degrees Celsius). If concrete is pumped, the temperature of the concrete at point of placement shall be a minimum of 50 degrees Fahrenheit (10 degrees Celsius) and a maximum of 90 degrees Fahrenheit (32 degrees Celsius). A maximum concrete temperature shall not apply to Class PP concrete.

(b) Concrete in Structures. Concrete may be placed when the air temperature is above 40 degrees Fahrenheit (4 degrees Celsius) and rising, and concrete placement shall stop when the falling temperature reaches 45 degrees Fahrenheit (7 degrees Celsius) or below, unless otherwise approved by the Engineer. The temperature of the concrete immediately before placement shall be a minimum of 50 degrees Fahrenheit (10 degrees Celsius) and a maximum of 90 degrees Fahrenheit (32 degrees Celsius). If concrete is pumped, the temperature of the concrete at point of placement shall be a minimum of 50 degrees Fahrenheit (10 degrees Celsius) and a maximum of 90 degrees Fahrenheit (32 degrees Celsius). When insulated forms are used according to Article 1020.13(d)(1), the maximum temperature of the concrete mixture immediately before placement shall be 80 degrees Fahrenheit (25 degrees Celsius).

Portland Cement Concrete Art. 1020.15 835 When concrete is placed in contact with previously placed concrete, the temperature of the freshly mixed concrete may be increased to 80 degrees Fahrenheit (25 degrees Celsius) by the Contractor to offset anticipated heat loss. **(c) All Classes of Concrete.** Aggregates and water shall be heated or cooled uniformly and as necessary to produce concrete within the specified temperature limits. No frozen aggregates shall be used in the concrete. **(d) Temperature.** The concrete temperature shall be determined according to **ASTM C 1064 (C1064M)**.

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