



**EASTERN IOWA COMMUNITIES**

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Established 1997

**Cold Weather Requirements for Concrete Placement**

**1. Purpose**

1.1 The purpose of this policy is to regulate the placement of concrete during cold weather by application of currently accepted codes and standards. This policy is an interpretation of agreed upon building codes and standards for adoption by member jurisdictions of the EICCC.

**2. Scope**

2.1 This policy shall apply to all new or replacement concrete that is placed during cold weather. This shall include but is not limited to footings, walls, slabs, sidewalks, and drives.

**3. Requirements**

3.1 Cold weather practice is required when the National Weather Service forecasts an air temperature below 40° F (4°C) at the time of concrete placement or during the required protection period per Table 1 below.

<b>Table 1 - Required Protection Period</b>			
Forecast Exposure	Concrete Element	Required Protection Period	
		Normal Concrete	Accelerated-Set Concrete
> 32° F (0°C) < 40° F (4°C)	Footings, Slabs on Grade, & Walls	<b>2 Days</b>	<b>1 Day</b>
> 10° F (-12°C) < 32° F (0°C)	Footings & Slabs on Grade	<b>3 Days</b>	<b>2 Days</b>
> 10° F (-12°C) < 32° F (0°C)	Walls	<b>6 Days</b>	<b>4 Days</b>
> 10° F (-12°C) < 32° F (0°C)	Suspended Slabs & Beams	<i>Professional Design Required</i>	
< 10° F (-12°C)	All Concrete Placement	<i>Professional Design Required</i>	

3.2 An approved method of weather protection must be on site for a passing inspection when temperatures below 40° F (4°C) are expected within the first 24 hours after concrete placement.

3.3 Blankets, straw covered by secured tarp, or tented plastic with heat may be considered adequate for cold weather protection and shall be kept in place for the duration of the required protection period.

3.4 Concrete inspections will not be scheduled without approval of the building official when the temperature is predicted to drop below 10° F (-12°C) during the required protection period.

3.5 Cold weather protection, procedures, and length of the protection period for elements that are subject to full load when forms or shoring are removed (suspended slabs, cast-in-place concrete beams, etc.) shall be as directed by a qualified design professional.

3.6 Forms, reinforcing bar, embedded plates, fillers, and the ground with which concrete is to come in contact shall be free from ice and frost.

3.7 Dry calcium chloride shall not be field added to ready mix concrete. Calcium chloride and any other admixture must be used according to the manufacturer's specifications and guidelines.

3.8 Air entrained concrete shall be used when exposure to moisture and freezing and thawing conditions are expected.

**Safety is not by Accident**

#### **4. Recommended Best Practices per ACI**

**4.1** During cold weather, a high early strength concrete mix should be specified. Guidelines and manufacturer's recommendations for utilizing admixtures must be followed. Type III cement may be substituted for Type I cement to accelerate the curing of cold-weather concrete.

**4.2** Concrete materials and production methods should be selected so that the concrete temperature at delivery is a minimum of the following specified temperature limits:

<b>Outside/Ambient Air Temp:</b>	<b>Concrete Temp:</b>
Above 32° F (0°C)	60° F (16°C)
10° F (-12°C) to 32° F (0°C)	65° F (18°C)

**4.3** An approved means to provide additional heat may be required to maintain the concrete temperature at 55° F (13° C) for the duration of the required protection period as recommended by the ACI.

**4.4** Cold weather protection should be kept in place in a manner that prevents excessive moisture loss.

**4.5** Humidity is normally lowered when heating an enclosure. Membrane-forming curing compounds should be used to ensure that the concrete surface does not dry out too soon and cause plastic shrinkage cracks.

**4.6** Fossil fuel burning heaters can cause carbonation of newly placed concrete surfaces. This may cause unacceptable dusting. Therefore, combustion byproducts shall be vented from enclosures.

**4.7** After the full duration of the protection period, concrete should be allowed to acclimatize to the ambient temperature as gradually as practicable. The ICC concrete manual states that good practice is to maintain the concrete at or above 40° F (4°C) for four additional days after the protection period and not allow the concrete to drop more than 40° F (4°C) in 24 hours.

**4.8** Specific design and procedure(s) by a qualified professional and professionally specified concrete admixtures may be adequate, or allow less restrictive requirements, when approved by the qualified design professional and the building official.