

# MICHIGAN CONCRETE ASSOCIATION

## SPECIAL PROVISION FOR COLD WEATHER CONCRETING

MCA:KS,SMW

1 of 2

10-25-11

Use of this special provision is required whenever cold weather is expected or has occurred within 7 calendar days of concrete placement. Perform work in accordance with Sections 601 and 602 of the 2003 Michigan Department of Transportation Standard Specifications for Construction, except as herein provided:

### **a. Description**

Cold weather is determined to occur when the air temperature has fallen to, or is expected to fall below 40 degrees Fahrenheit. During cold weather, use measures to protect the concrete following placement and continuing until the concrete has reached its open to traffic strength.

When cold weather conditions are anticipated, submit a detailed plan for the production, transportation, placement, protection, curing, and temperature monitoring of concrete during cold weather. Do not commence concrete placement until the plan is approved by the Engineer. In the plan, include procedures for accommodating abrupt changes in weather conditions. Have all material and equipment required for protection available before commencing cold weather concreting.

Continue to provide an ASR-resistant mix when paving during cold weather conditions as per MCPA's Concrete Pavement Durability Special Provision.

### **b. Construction**

Provide concrete that has a minimum temperature of 55 degrees Fahrenheit at time of placement. Cold weather protection shall consist of a method or combination of methods that ensure the concrete temperature will be maintained above 50 degrees Fahrenheit from the time that it is placed until the concrete attains opening to traffic strength. Methods may consist of heating concrete ingredients, adding chemical accelerators, or physically covering the concrete with a protective barrier such as plastic sheeting, frost paper, insulating blankets, straw over plastic, or other methods approved by the Engineer. Place the cold weather protection as soon as it will not mar the surface of the pavement and protect the full exposed pavement surface throughout the protection period. The insulation material may be removed for saw cutting of the control joints in the pavement, but must be replaced immediately thereafter.

Fabricate field-cured open-to-traffic concrete test specimens (cylinders or beams) and store them until tested adjacent to the placement and under the cold weather protection, along with a high/low thermometer to monitor temperature.

Alternatively, the contractor may choose to monitor the strength and temperature of the in-place concrete using the Maturity Method (ASTM C 1074). The information will be used by the Engineer to evaluate whether or not the concrete has attained open to traffic strength.

If using the maturity method option, use at least three maturity measuring locations for each day's concrete paving operations. Two locations are to be designated by the Engineer. Place the third maturity device in the final 15 feet of paving. Place all maturity devices at mid-depth of the concrete near the outside edge of the slab, at least 1 foot and not more than 2 feet from the edge.

At least one month prior to cold weather concrete placement, develop maturity relationships for each mix design in accordance with ASTM C 1074 with the following additions or modifications:

- (1) The cylinders or beams used to establish the strength vs. maturity relationship shall be cast and cured in the field in conditions similar to the project.
- (2) These specimens shall be tested at 1, 3, 7, 14, and 28 days.
- (3) Testing to determine datum temperature or activation energy will not be required.

Submit the results of the maturity relationship development to the Engineer prior to cold weather concrete placement.

Provide the maturity measuring devices, probes, meters, and all necessary wires and connectors. Place, protect, and maintain the maturity devices, wires, and meters such that they remain in working order.

### c. **Measurement and Payment**

<b>Pay Item</b>	<b>Pay Unit</b>
Cold Weather Protection, Pavement.....	Square Yard
Cold Weather Protection, Curb.....	Foot
Cold Weather Protection, Driveway.....	Square Yard
Cold Weather Protection, Sidewalk.....	Square Foot

Payment for Cold Weather Protection includes equipment, labor, and materials to place, remove for relief sawing and replace, maintain, remove, and dispose of the insulating material to complete this item.

Any costs for heating materials, including startup and operation of equipment to heat materials, are included in the cost of these items.