

## **3902 FORM COATING MATERIAL**

### **3902.1 SCOPE**

Provide form coating material that will prevent bonding between a form, dowel, or other object and concrete.

### **3902.2 REQUIREMENTS**

Provide form coating material listed on the Approved/Qualified Products List and meeting the following requirements:

- (1) Made of a chemical release agent that does not contain ordinary lubrication oil, conventional form oil, fuel oil, or kerosene, and has a flash point of at least 149 °F [65 °C] when tested in accordance with ASTM D 92;
- (2) Prevents bonding to concrete;
- (3) Does not penetrate, stain, or leave a residual film on the concrete surface; and
- (4) Does not attract dirt or other deleterious matter.

Apply the form coating material at a rate recommended by the manufacturer to provide a smooth surface free of dusting action caused by reactions of the chemical release agent.

As a substitute for a form coating material listed on the Approved/Qualified Products List, the Contractor may provide dowel bars, baskets, and reinforcement bars coated with a factory applied, Department-approved petroleum, paraffin based lubricant.

### **3902.3 SAMPLING AND TESTING — (BLANK)**

## **3906 WATER FOR CONCRETE AND MORTAR**

### **3906.1 SCOPE**

Provide water for use in mixing and curing portland cement concrete and mortar.

### **3906.2 REQUIREMENTS**

Provide water approved by the Engineer and meeting the following requirements for mortar or concrete:

- (1) Not salty or brackish
- (2) Clean, and

- (3) Free of injurious quantities of deleterious substances such as oil, acid, alkali, and organic matter.

The Engineer will allow potable water without testing.

The Engineer may conduct testing to determine allowable use of a Contractor proposed water source. The Engineer will reject the water, if any of the test results in accordance with AASHTO T 26 show the following:

- (1) Unsoundness
- (2) Change in time of setting greater than 1 h earlier or greater than 1½ h later, or
- (3) A reduction of greater than 10 percent in the 7-day mortar strength.

Before using clarified wash water for concrete and mortar, submit a request to the Engineer for review and approval by the Concrete Engineer.

### **3906.3 SAMPLING AND TESTING**

Provide representative samples of water in clean containers to the Engineer for testing as required by the Schedule of Materials Control.

## **3910 ROCK SALT**

### **3910.1 SCOPE**

Provide rock salt for use as a deicer for road construction and maintenance purposes.

### **3910.2 REQUIREMENTS**

Provide rock salt meeting the following requirements at the time of delivery:

- (1) ASTM D 632 for Type 1, Grade 1 material;
- (2) Free of lumps, aggregations, and foreign matter; and
- (3) With no greater than 1.5 percent moisture content.

### **3910.3 SAMPLING AND TESTING**

The Engineer may sample and inspect the rock salt at the supplier's unloading and storage facilities or at the point of delivery.

The Engineer, in conjunction with the Materials Engineer, will perform the following:

- (1) Sampling meeting the requirements of ASTM D 632, as modified by the Laboratory Manual;
- (2) Moisture testing in accordance with the Laboratory Manual;
- (3) Sieve analysis meeting the requirements of ASTM C 136 for Sieve Analysis of Fine and Coarse Aggregate, as modified by the Laboratory Manual; and
- (4) Chemical analysis for determination of sodium chloride content meeting the requirements of the Rapid Test Method for Sodium Chloride by Silver Nitrate Potentiometric Titration or the Reference Method for Chemical Analysis of Sodium Chloride as modified by the Laboratory Manual.

## **3911    CALCIUM CHLORIDE**

### **3911.1   SCOPE**

Provide liquid and solid calcium chloride for use in dust control, accelerating the hardening of concrete, and other purposes.

### **3911.2   REQUIREMENTS**

Provide liquid or solid calcium meeting the requirements of AASHTO M 144 for the type and grade required by the contract. Unless the contract requires otherwise, provide liquid calcium chloride with at least 38 percent anhydrous  $\text{CaCl}_2$  by weight. Provide liquid calcium chloride that is clear and free of solid matter.

### **3911.3   SAMPLING AND TESTING**

Provide samples at rates and sizes meeting the requirements of the Schedule of Materials Control or as required by the contract.

Perform sampling in accordance with ASTM D 345.

The Engineer, in conjunction with the Materials Engineer, will perform tests meeting the requirements of ASTM D 345.

## **3912    MAGNESIUM CHLORIDE SOLUTION**

### **3912.1   SCOPE**

Provide magnesium chloride solution for dust control or other purposes.

### **3912.2 REQUIREMENTS**

Provide magnesium chloride solution meeting the following characteristics and requirements:

- (1) Water clear,
- (2) Free of deleterious substances,
- (3) Consists primarily of magnesium chloride,
- (4) Anhydrous magnesium chloride content of at least 28 percent by mass,
- (5) SO<sub>4</sub> sulfate content no greater than 3.5 percent by mass, and
- (6) Alkali chlorides content no greater than 5 percent by mass.

### **3912.3 SAMPLING AND TESTING**

#### **A Sampling**

Provide samples at rates and sizes meeting the requirements of the Schedule of Materials Control or as required by the contract.

#### **B Testing**

The Engineer, in conjunction with the Materials Engineer, will perform testing meeting the following requirements:

**B.1 Magnesium chloride, MgCl<sub>2</sub> .....Laboratory Manual**

**B.2 Sulfate, SO<sub>4</sub>.....Laboratory Manual**

**B.3 Alkali chlorides, as NaCl..... ASTM E 449**

## **3973 BURIED CABLE SIGNS**

### **3973.1 SCOPE**

Provide buried cable signs to mark the route of underground fiber optic cables.

### **3973.2 REQUIREMENTS**

#### **A Buried Cable Sign**

Install aluminum signs meeting the following requirements and characteristics:

- (1) In accordance with 3352, "Signs, Delineators, and Markers," and 2564, "Traffic Signs and Devices;"
- (2) Meeting the requirements of Standard Signs Manual;
- (3) 8 in × 12 in [200 mm × 300 mm]; and

(4) Black legend on a non-reflective orange face.

Before purchasing the buried cable signs, obtain the Engineer's approval of the sign design.

Install the ground mounted signs to 2.6 lb per ft [3.8 kg per m] galvanized steel fence posts in accordance with 3401, "Flanged Channel Sign Post." If installing the signal mounted signs to the Ramp Control Signal, use stainless steel bands and fittings.

**B Legend and Logo Size**

Provide an 8 in × 12 in [200 mm × 300 mm] aluminum buried cable sign with black legend silk screened on an orange face meeting the requirements of the Standard Signs Manual and the following:

<b>Table 3973-1 Buried Cable Sign Legend</b>			
<b>Line Number</b>	<b>Line Text</b>	<b>Character Size and Color, in [mm]</b>	<b>Background Size and Color, in [mm]</b>
1	CAUTION	1.1875 [30], orange	1.5 × 7 [50 × 180], black*
2	BURIED	0.9375 [24], black	—
3	FIBER OPTIC	0.9375 [24], black	—
4	CABLE	0.9375 [24], black	—
5	BEFORE DIGGING	0.65625 [17], black	—
6	CALL	0.65625 [17], black	—
7	GOPHER STATE ONE CALL	0.5 [13], black	—
8	811	0.90625 [23], black	—
9	Mn/DOT LOGO	—	—
<p>* Center the information on the background     The Mn/DOT logo is a circle with a diameter of 1.03125 in [26 mm] and the phrase "MINNESOTA DEPARTMENT OF TRANSPORTATION" in black letters in the margin with an orange background. The left half of the logo inside the margin has an orange silhouette of the left one half of a coniferous tree on a black foreground. The right half of the logo inside the margin has an orange five point star silhouette inside a black foreground.</p>			

**C Sign Placement**

Place the signs no greater than 500 ft [150 m] apart, and at each change of direction, along the route of direct buried fiber optic cable.

**3973.3 SAMPLING AND TESTING ..... 2550**