

## SECTION 211

sheathing only.

All ties, bolts, nails and other metal specifically required for construction purposes shall be removed or cut back to a depth of 50 mm from the surfaces of the concrete and the resulting holes filled.

No dry ties shall be permitted; form tie rods shall remain embedded and terminate not less than 50 mm from the formed face of the concrete. Removable embedded fasteners on the ends of the rods shall be such as to leave holes of a regular shape for reaming and filling.

Patching shall be:

- patch installation projecting slightly from the surrounding concrete surface.
- after 24 hours, saturated and carefully finished to render the surfaces of the patch true to the surrounding concrete, but any grinding using a hand carborundum stone kept to a minimum.

When a rubbed finish is required, the applied mortar shall be carefully worked into the surface area being finished and, using a hand carborundum stone manipulated in a circular motion, the entire surface rendered true and smooth with all excess mortar removed.

**211.17.04 Class 3 Finish Alternative Procedures** – Class 3 Finish alternative procedures when, in the opinion of the Ministry Representative, the formwork may safely be removed at an early age and the concrete finished while still partly plastic, shall include the following:

- careful removal of the formwork when the concrete has sufficiently hardened so as to hold its shape.
- finishing the surfaces immediately (within 4 to 8 hours of casting, depending upon weather).
- careful rubbing of the concrete surfaces with a carborundum stone, occasionally wetting same to produce a paste from the surface of the concrete.
- rubbing continued, adding necessary sand-cement mortar in small quantities to fill voids, until all voids and form marks are removed.
- surface curing as specified.

Modifications to the surface texture shall be achieved by grinding or other means.

**211.17.05 Patching Mortar** – Patching mortar where specified above shall be constituted as follows:

Cement:	60% Normal Portland 40% White Normal Portland
Liquid:	70% Water 30% Latex Bonding Agent
Sand:	Passing a 1.25 mm sieve

**NOTE:** Cement blend above may be adjusted to provide close BC MoT

## PORTLAND CEMENT CONCRETE

match to the concrete colour.

### 211.18 Hot Weather Concreting

When ambient air temperature is 25°C or higher or there is a probability of it rising to 25°C during the placing period (as forecast by the nearest official meteorological office), hot weather concreting procedures as outlined below, shall be used, for all concrete other than deck concrete. Additional requirements for hot weather concreting for bridge decks including diaphragms, bridge parapets, bridge medians, bridge sidewalks and approach slabs are given in SS 413, Bridge Decks and Concrete Overlays.

Prior to the placement of concrete, the Contractor shall submit to the Ministry Representative for acceptance, the proposed placing operations complying with the requirements for hot weather concreting.

Curing shall be accomplished by water spray or by using saturated absorptive material, such as burlap.

Formwork, reinforcement and concreting equipment shall be protected from the direct rays of the sun or cooled by fogging and evaporation.

Concrete for piers, abutments and footings of bridges shall not have a temperature greater than 25°C at any time prior to placement and curing.

The initial temperature of concrete prior to placement may be estimated from the temperatures of its ingredients by using the following equation:

$$T = \frac{0.22(T_a M_a + T_c M_c) + T_w M_w + T_{wa} M_{wa}}{0.22(M_a + M_c) + M_w + M_{wa}}$$

where  $T_a$ ,  $T_c$ ,  $T_w$  and  $T_{wa}$

= temperature in °C of aggregates, cementing materials, added mixing water, and free water on aggregates, respectively

where  $M_a$ ,  $M_c$ ,  $M_w$  and  $M_{wa}$

= mass in kilograms of aggregates, cementing materials, added mixing water, and free water on aggregates, respectively

If deemed necessary, the Contractor shall employ the following hot weather concreting procedures to reduce the concrete temperature:

#### a) Mixing Water

- Shading of storage tanks and water supply lines;
- Refrigeration of mixing water; and/or
- Adding cubed, shaved or chipped ice directly to the concrete mixer drum, and ensuring ice is of a particle size to be completely melted before the concrete is discharged from the