

Section 420

Keep readily available on site an adequate supply of suitable coverings that will protect the surface of the freshly placed bridge floor from rain. After the water sheen disappears from the surface and before the concrete becomes non-plastic, finish the surface of the floor further by burlap dragging, fine bristle brooming, belting, or other acceptable method which produces an acceptable uniform texture.

Cure the concrete in accordance with Article 420-16, except do not use the Membrane Curing Compound Method. Prior to reaching initial set, place a curing medium consisting of burlap under polyethylene sheets or another approved material on the deck and keep moist for a minimum of 7 curing days. Wet the burlap or other approved curing medium prior to placing on the deck. Apply water to the curing medium through soaker hoses or another approved method. Apply water in amounts to keep the medium moist but do not allow the water to flow or pond on the deck.

After curing the concrete, test the finished surface by means of an approved rolling straightedge designed, constructed, and adjusted to accurately indicate or mark all floor areas which deviate from a plane surface by more than 1/8 inch in 10 feet (3 mm in 3 m). Remove all high areas in the hardened surface in excess of 1/8 inch in 10 feet (3 mm in 3 m) with an approved grinding or cutting machine. Where variations are such that the corrections will extend below the limits of the top layer of grout, seal the corrected surface with an approved sealing agent as required. If approved, correct low areas in an acceptable manner. Produce corrected areas that have a rough, uniform texture and present neat patterns. In all cases, maintain a minimum of 2 inches (50 mm) of concrete cover over reinforcement.

Unless otherwise indicated on the plans, groove bridge floors. Produce grooves that are perpendicular to the centerline of bridge. Do not start grooving until final straightedging and, when necessary, acceptable corrective measures are complete. Cut grooves into the hardened concrete using a mechanical saw device which leaves rectangular grooves 1/8 inch (3 mm) wide and 3/16 inch (5 mm) deep. Produce grooves that have a center to center spacing of 3/4 inch (19 mm). Do not groove the floor surface within 18 inches (460 mm) of the gutter lines and 2 inches (50 mm) of expansion joints or elastomeric concrete in expansion joint blockouts. On skewed bridges, ungrooved triangular areas adjacent to the joint are permitted, provided the distance from the centerline joint to the nearest groove, as measured parallel to the centerline of roadway, does not exceed 18 inches (460 mm). Between expansion joints on horizontally curved bridges, periodically adjust the grooving operation such that adjacent grooves are separated by no more than 3 inches (75 mm) along the outer radius of the bridge floor.

Continuously remove all slurry or other residue resulting from the grooving operation from the bridge floor by vacuum pick-up or other approved methods. Prevent slurry from flowing into floor drains or onto the ground or body of water under the bridge. Dispose of all residue off the project.

(C) Inspection:

The Engineer observes all phases of the construction of the bridge deck slab. These phases include installation of the metal forms; location and fastening of the reinforcement; composition of concrete items; mixing procedures, concrete placement and vibration; and finishing of the bridge deck.

After the deck concrete is in place for a minimum period of 2 days, test the concrete for soundness and bonding of the metal stay-in-place forms by sounding with a hammer as directed. For a minimum of 50% of the individual form panels, as selected by the Engineer, hammer test over the entire area of the panel. If areas of doubtful soundness are disclosed by this procedure, remove the forms from such areas for visual inspection after the pour attains a minimum compressive strength of 2400 psi (16.5 MPa). Remove the stay-in-place forms at no additional cost to the Department.

At locations where sections of the forms are removed, do not replace the forms, but repair the adjacent metal forms and supports to present a neat appearance and assure their satisfactory retention. As soon as the forms are removed, allow the Engineer to examine for cavities, honeycombing and other defects. If

irregularities are found, and in the opinion of the Engineer these irregularities do not justify rejection of the work, repair the concrete as directed. If the concrete where the forms are removed is unsatisfactory, remove additional forms, as necessary, to inspect and repair the slab. Modify the methods of construction as required to obtain satisfactory concrete in the slabs. Remove and repair all unsatisfactory concrete as directed.

Provide all facilities as are reasonably required for the safe and convenient conduct of the Engineer's inspection procedures.

420-16 CURING CONCRETE.

(A) General:

Unless otherwise specified in the special provisions, use any of the following methods except for membrane curing compounds on bridge floors unless permitted in conjunction with the polyethylene sheeting method. Advise the Engineer in advance of the proposed method. Have all material, equipment, and labor necessary to promptly apply the curing on the site before placing any concrete. Cure all patches in accordance with this article. Improperly cured concrete is considered defective.

When used in this article, curing temperature is defined as the atmospheric temperature taken in the shade away from artificial heat, with the exception that it is the temperature surrounding the concrete where the concrete is protected in accordance with Article 420-9.

A curing day is defined as any consecutive 24 hour period, beginning when the manipulation of each separate mass is complete, during which the air temperature adjacent to the mass does not fall below 40°F (4°C).

After placing the concrete, cure it for a period of 7 full curing days.

Take all reasonable precautions to prevent plastic shrinkage cracking of the concrete, including the provision of wind screens, fogging, application of an approved temporary liquid moisture barrier, or the early application of temporary wet coverings to minimize moisture loss.

Repair, remove, or replace as directed concrete containing plastic shrinkage cracks at no cost to the Department.

(B) Water Method:

Keep the concrete continuously wet by the application of water for a minimum period of 7 curing days after placing the concrete.

When using cotton mats, rugs, carpets, or earth or sand blankets to retain the moisture, keep the entire surface of the concrete damp by applying water with a nozzle that so atomizes the flow that a mist and not a spray is formed, until the surface of the concrete is covered with the curing medium. Do not apply the moisture from the nozzle under pressure directly upon the concrete and do not allow it to accumulate on the concrete in a quantity sufficient to cause a flow or wash the surface. At the expiration of the curing period, clear the concrete surfaces of all curing mediums.

(C) Membrane Curing Compound Method:

Spray the entire surface of the concrete uniformly with a wax-free, resin-base curing compound conforming to the requirements of Article 1026-2. Use clear curing compound to which a fugitive dye is added for color contrast on bridge superstructures and substructures, and on retaining walls.