FY 2017/2018 QC Category No. 10C
STATEWIDE INSPECTION GUIDELIST
Bridge Structures - Concrete Decks

FORMING

1. Removable form concerns: form material and dimensions, accurate positioning, and adequate capacity to support the load of plastic concrete. Welding of form hardware (removable or SIP) to structural steel is not permitted. [Spec. 400-5]

2. Stay-in-place (SIP) metal form systems have numerous Spec requirements. Check for coating defects on all surfaces of polymer coated SIP form elements prior to their installation. [Spec. 400-5]

3. For prestressed concrete beam superstructures, check beam cambers and adjust forms for deviations in camber from those shown in the original plans. Discuss this issue at the preconstruction conference. [Spec. 400-5, 450-16 & Good Practice]

4. Expansion joints may be placed before or after deck planing but must be within strict tolerances in either case. [Spec. 400-10]

PLACING AND TYING REBAR

5. Rebars shall be stored properly aboveground and be free of foreign matter. Rebars shall be kept away from conditions capable of producing rust. Hot bending, welding or flame cutting are not allowed. [Spec. 415-3 & 415-4]

6. Each rebar shall be tied within 1" of plan position and the tolerance for concrete cover is minus 1/4 inch or plus 1/2 inch from the plan dimensions. Splices shall be securely clamped or tied. [Spec. 415-5]

7. Tying for each mat: a double strand single tie used at every intersection on the periphery and for all other intersections, every third location. [Spec. 415-5]

8. Concrete block and bolster materials and placement have numerous Spec requirements. On removable forms, plastic bar supports and steel supports with either molded plastic legs, plastic coated leg tips or plastic protected rails, are allowed. Do not use metal bar supports in contact with removable forms or floor surfaces in extremely aggressive environments. [Spec. 415-5]

9. Ensure that no more than 5% of the rebar supports exhibit unsatisfactory performance, breakage or permanent deformation during bar tying and concrete placement operations. [Spec. 415-5]

SCREED DRY RUN

10. Perform dry runs after rebar has been placed and screed rails and headers are set. Thickness and clearances should be checked in every bay at longitudinal intervals not

greater than 10 ft. [Spec. 400-7 & Good Practice]

11. Deck thickness and rebar clearance measurements should be taken from the bottom of the screed rollers and the screed rollers should be directly over the point where the measurement is to be taken. No deck concrete placement shall be allowed if the deck thickness measurement during the dry run is less than the required plan thickness. [CPAM 10.3 & Good Practice]

PLACING DECK CONCRETE

12. Do not place bridge deck concrete if during placement the average wind velocity forecast exceeds 15 mph as reported by the National Weather Service. [Spec. 400-7]

13. Approvals required for screed or strike off device and concrete placed in continuous strips (transverse or longitudinal) with no time for initial set between strips except at planned joints. [Spec. 400-7 & Good Practice]

14. Minimum concrete placement rate 20 yd^3/hr for placements 50 yd^3 or less and 30 yd^3/hr for greater than 50 yd^3. All deck concrete between construction joints must be in place before initial set of any of the concrete begins. [Spec. 400-7]

15. Temporary erection supports must be released for steel beams before deck placement. Intermediate diaphragms must be poured at least 48 hours before deck placement. [Spec. 400-7]

16. Unhardened concrete must be completely protected from rain and running water by a system that does not make contact with the concrete. Do not place concrete during rain. [Spec. 400-7]

17. Metal forms and rebar shall be sprayed with cool fresh water just prior to placement of concrete for decks in hot weather. If re-spraying of forms and rebars is required after concrete placement starts, never spray onto the fresh concrete unless specifically authorized by the Engineer. [Spec. 400-7]

SCREEDING AND FINISHING

18. Prior to all concrete placements, all bulkheads and rails must be set to proper grade and the screed must adjust for all variances. [Spec. 400-7]

19. Intermediate screed rails are not permitted, unless approved by the Engineer, and the screed must comply with the specification. [Spec. 400-7]

20. For short and miscellaneous bridges, the deck must be longitudinally straight edged with a 10 ft straightedge, half lapped, 5 ft transversely. [Spec. 400-15]

21. For long bridges, the deck must be planed to a minimum of ¼ inch depth, not to exceed ½ inch, and also meet or exceed the profilograph smoothness criteria. [Spec. 400-15]

22. For short and miscellaneous bridges after water sheen and before initial set, the plastic deck surface must be finished with burlap drag, fine broom or float. No blemishes, marks, or scratches are allowed greater than 1/16" in depth. [Spec. 400-15 & Good Practice]

23. For long bridges, correct all flaws such as cavities, blemishes, marks, or scratches that will not be removed by 1/4" planing. [Spec. 400-15]

24. When required by plans crack control grooves must be installed either by tooled “V” groove prior to initial set or by early entry dry cut saw. [Spec. 400-9]

CURING

25. Monitor surface moisture evaporation rates during placement and do not exceed 0.1 $lb/ft^2/hr$ unless countermeasures for retaining moisture such as application of evaporation retarder or fogging are employed. Do not apply water to the concrete to aid finishing operations unless authorized by the Engineer. [Spec. 400-16]

26. For Long bridge decks, application of Type 2 (white) curing compound to the deck surface must be complete within 2 hours from the initial placement of concrete and when the surface is damp with a minimum spread rate of 0.06 gal/yd² or 1 gal/150 square feet. For Short bridges, apply curing compound as above but after the initially placed concrete has been floated, straightedged, textured and a damp surface condition exists. The spread rate must be reported to the Engineer. [Spec. 400-16]

27. Curing compound for barrier walls must be applied at the proper spread rate within 30 minutes or before loss of water sheen and must remain in place for at least 7 days [Spec. 400-16]

28. Properly sealed curing blankets must be placed as soon as possible with minimal effect on the surface texture for a minimum of 7 days. Wet all curing blankets immediately after placing. Blanket materials must meet specifications and burlap-polyethylene sheeting is required to have a minimum weight of 1-1.8 ounces/square feet for two layers or 0.6-0.7 ounces/square feet for four layers. [Spec. 925-3, 400-16]

29. Heavy loads must not be applied for 14 days after concrete placement unless approved by the Engineer, based on beam or cylinder breaks or based on the approved signed and sealed calculations prepared by a Specialty Engineer. [Spec. 400-17]

FORM REMOVAL

30. Time of removal for forms shall be determined from minimum time requirement, compressive strength tests, time versus strength curve (S/T Curve) per specification, or as directed by the Engineer. Detailed specifications for cylinder testing and strength determination are required in order to remove forms. Apply membrane curing

compound to all surfaces stripped of forms within one hour of loosening. [Spec. 400-14 & 400-16]

GROOVING

31. Grooving shall take place only after concrete smoothness requirements have been met, after planing (for Long bridges) and before opening to traffic. [Spec. 400-15]

32. Prior to grooving, a detailed smoothness evaluation must be performed and the bridge requires at least ¼ inch depth of longitudinal planing unless it is a short bridge in order to achieve acceptable ride quality. [Spec. 400-15]

33. Grooves must be continuous from gutter to gutter, within 18" of gutter; and must be per specifications at joints, for skews, and for spacing and depth. [Spec. 400-15]