Wearing Coat on Bridges

Government of Maharashtra ,
Public Works & Housing Department,
Technical Circular No.CEC-1179/50677/CR-225/D-29-A,
Mantralaya Bombay 400 032
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1.0 It is the present practice in the Department to lay Cement Concrete 1:2:4 Wearing Coat with light reinforcement comprising of R.S.bars 6 mm @ 300 c/c both ways on cross drainage works and bridges as per the Government of Bombay, Public works Department Circular Memorandum No.0/71840-C, dated 22-9-1959.

2.0 It is , however observed that the C.C. wearing coat on many bridges has get badly damaged . In consultation with the Chief Engineers of the Department , it is proposed to follow the specifications for wearing coat on bridges as detailed below

3.0 Bituminous wearing coat

3.1.0 Bituminous wearing coat should preferably be provided on all high level and high level submersible bridges. It may also be provided on submersible bridges in areas with annual rainfall upto 100cm.

3.2.0 The types of bituminous wearing coat should be as follows:

(a) Traffic intensity less than 4000 tonnes/ day. (Corresponding to less than CBR design curve E)
50 mm thick full grout plus 25 mm pre-mix carpet with liquid seal coat 25 mm. is suggested for obtaining smooth riding surface and to facilitate subsequent repairs if needed.

(b) Traffic intensity between 4000 tonnes/ day and 40000 tonnes/ day.
(Corresponding to traffic intensity between Civil Design curve E and F) 50 mm thick bituminous macadam plus 25 mm asphaltic concrete (both hot mix hot laid).

(C) Traffic intensity above 40000 tonnes/ day.
(Corresponding to traffic intensity above CBR Design Curve G).
Asphaltic Concrete in two layers (Hot mix hot laid).
(i) Base layer 40 mm.
(ii) Surface layer 25 mm.

3.3.0 A disadvantage of bituminous wearing coat is that, bullock cart traffic causes damages , because of cutting action of iron rims. In view of this , bituminous wearing coat should not be provided where bullock cart traffic is more than 300 loads bullock carts per day eg. Near sugar factories where the cart traffic is expected to be heavy.

3.4.0 Specifications

i) Full Grout : Standard Specifications (Red Book) issued by Govt. of Maharashtra, B&C Department and I.R.C./20-1966 (Latest edition).

ii) Bituminous macadam : Standard Specifications (Red Book) issued by Govt. of Maharashtra, B&C Department and I.R.C./27-1967 (Latest edition).

iii) Asphaltic Concrete :Standard Specifications (Red Book) issued by Govt. of Maharashtra, B&C Department and I.R.C./27-1967 (Latest edition).

3.5 Preparation of surface of Deck Slab :

i) First the deck slab should be finished rough and it's surface cleaned of all foreign matter laitance and loose or scaled concrete.

ii) A tack coat of straight run bitumen of a suitable grade should then be applied to the clean dry surface at the rate of 10 kg/10 M2 at appropriate temperature.

4.0 C.C. wearing Coat with Light Reinforcement:

C.C. wearing coat should be provided to the following specifications on all submergible bridges in areas where annual rainfall is over 100 cm.

(a) C.C. Mix : M-20 for all environments including maring environment.

(b) i) slump should not exceed 25 mm

ii)water cement ratio should not exceed 0.55 in case the consistency is not obtained, a plasticiser of approved made made should be used with the prior approval of the Engineer incharge.

(c) Thickness : 75 mm.

(d)Reinforcement: M.S. bars, 6mm dia. @ 300 mm c/c both ways at mid depth.

(e) Joints : I) Central longitudinal joints should not be provided.

ii) Longitudinal joints along the kerbs on either side may be provided with bitumen filler material.

iii) Transverse joint should be only construction joints with reinforcement taken across the joint.

iv) Expansion joints as usual should be provided at the end of the span. Extra reinforcement should be provided near expansion joints as shown in the accompanying drawing.

(f) Bond : No special efforts to make the top surface of deck slab smooth are considered necessary.The top surface of the deck slab should be cleaned/ thoroughly with wire brush and well watered before laying the concrete wearing coat.

5.0 Camber

5.1.0 : A Camber of 2% should be provided for both C.C. as well as bituminous wearing coat.

5.2.0 :The required camber should be achieved by adjustment in substructure (see note 12 on drawing).

5.3.0 : The thickness of wearing coat shall be uniform.

6. In case of bridges in hilly and inaccessible areas, the type of wearing coat to be provided should be finally decided by Regional Chief Engineers.

Sd/-
Superintending Engineer and
Deputy secretary to Government.