

**Government of India**  
**Ministry of Surface Transport ( Roads Wing )**  
**Transport Bhavan,**  
**1, Parliament Street,**  
**New Delhi, Dt/- 9-2-1988.**  
**No. RW/PL-17(8)/76-NH-Stds.**

To,

The Chief Engineer of all State P.W.Dns/I.Ts. ,  
Dealing with National Highways,  
The Ditector General ( Works ) , New Delhi,  
The Director General ( Border Roads ) New Delhi.

Sub- Construction of water bound macadam overlays for strengthening existing road pavements having bituminous surfacing / wearing course - guidelines of -

Sir,

Water bound macadam ( W. B. M. ) has been the main stay of construction of new road pavements in the country from economical and other considerations and is also being generally used as overlay for strengthening existing pavements having thin bituminous wearing course where the strengthening requirement is of large magnitude i.e. more than 150 mm.

Specifications for construction of sound W.B.M. are contained in Clause 404 of the Ministry's " Specifications for road and bridges works " as also in the I.R.C. standard on the subject (IRC. 19-1987 ) . Despite this failure have been observed in some case, particularly where this material has been used as an overlay for strengthening existing bitumen surfaced pavements.

A. part from others, the special requirements for ensuring good performance of W.B.M. overlays essentially relate to good bonding with the existing pavement and availability of adequate facility for drainage at the interface of the existing surface and the W.B.M. overlay course. For durable performance and for avoiding any premature failure of pavements with such overlays it is emphasised that the following points should be specially kept in view for the strengthening works with W.B.M. overlays on the existing bitumen surfaced roads :-

- (i) Normally, W.B.M. overlay is suitable for strengthening existing inadequate pavements with thick (thickness upto 40mm ) bituminous wearing course which usually will be in a distressed and / or worn out condition. For such cases, the existing bituminous wearing course should be completely picked out , removed and the existing W.B.M. course rebuilt after providing and appropriate profile corrective

course prior to laying of W.B.M. overlay should be of grading No. 3 course aggregate as per Clause 404 of the Ministry's Specifications.

- (ii) As far as possible, W.B.M. overlay on existing thick ( thickness greater than 40mm) bituminous surfacing ( base course + wearing course ) should be avoided. Instead, bitumen - bound course like built-up spray grout ( single course only ) , bituminous macadam, dense bituminous macadam etc. as appropriate in accordance with the guidelines contained in the Ministry's Circular No. RW/ 33059/29/87-NH-Stds. Dated 7-5-1987 should be adopted.
- (iii) However, in exceptional cases in locations where the annual rainfall is low i.e. upto 150mm and the existing bituminous surfacing wearing course is not distressed and the strengthening requirement is of large magnitude i.e. 150mm or more, W.B.M. can be laid over the existing thin / thick bituminous surface after cutting on the surface 75mm with furrows at an angle of  $45^{\circ}$  to the centre line of the pavement at 1 metre intervals. The direction of the furrows should be such that they also function as interceptor of surface/ sub-surface drainage of the pavement layer(s).
- (iv) Depth of the furrows should be a minimum of 75mm. and should expose the existing granular base course ( see Fig. Enclosed ). Further for improving lateral drainage and to quickly dispose of water collected at the interface, the shoulders should be constructed with granular sub-base material corresponding to clause 401 of the Ministry's specifications. However, when it is not possible, to provide granular material in the shoulder due to paucity of funds, longitudinal and lateral drains at appropriate depth be provided for the drainage requirement of the existing granular pavement layers.
- (v) Screening of blinding material used for filling the voids in the W.B.M. layer should be predominantly non- plastic with P.I. not exceeding 6.
- (vi) The W.B.M. layer should be compacted as per Clause 404 of the Ministry's Specifications for Road and Bridges works till the coarse aggregates are well keyed and firmly set to their full depth.
- (vii) The top of the W.B.M. Strengthening course - should be primed in accordance with the guidelines given in the Ministry's Circular No. NH-VI-67(11)/85 dated 31.1.1986 prior to application of any bituminous course.
- (viii) Suitable arrangements for management and diversion of traffic during execution of the work should be made in accordance with the guidelines given in the Ministry's Circular No. RW/33038/1/87-NJ-Stds. Dated. 7-10-1987.

It is requested that the contents of this Circular be brought to the notice of all Officers of your Department engaged on National Highways Works or other centrally aided road works . Feed - back on the subject will be welcome.

Yours faithfully,

Sd/-

( R. K. Saxena. )

Chief Engineer ( Roads )

for Director General ( R.D. )