



No. RW/NH-35072/05/2018-S&R(P&B)

GOVERNMENT OF INDIA

MINISTRY OF ROAD TRANSPORT & HIGHWAYS

S&R(P&B) Section

Transport Bhavan, No.1, Parliament Street, New Delhi-110001.



BHARATMALA  
ROAD TO PROSPERITY

Dated: August 24, 2018

To

1. The Chief Secretaries of all the State Governments/ UTs
2. The Principal Secretaries/ Secretaries of all States/ UTs Public Works Department dealing with National Highways, other centrally sponsored schemes.
3. All Engineers-in-Chief and Chief Engineers of Public Works Department of States/ UTs dealing with National Highways, other centrally sponsored schemes.
4. The Director General (Border Roads), Seema Sadak Bhawan, Ring Road, New Delhi-110010.
5. The Chairman, National Highways Authority of India, G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.
6. The Managing Director, NHIDCL, PTI Building, New Delhi-110001
7. All CE-ROs, ROs and ELOs of the Ministry

**Subject: Use of Bitumen & Modified bitumen in the construction of flexible pavements and source of their procurement for National Highways works.**

The design of flexible pavement is primarily governed by the fatigue cracking in the bituminous layer and pavement deformation/ rutting in the sub-grade and other non-bituminous layer. The fatigue cracking failure depends upon the stiffness/ resilient modulus of the bituminous layer, which varies considerably with the variation of temperature and the grade of the bitumen used. Besides fatigue cracking in the bituminous layer, the top layer (wearing coat) of the bituminous layer also gets oxidized over a period of time and also leads to development of cracks in the wearing coat.


2. The stiffness/ modulus of resilient substantially decreases with the increase of temperature in all grades of bitumen and also in case of modified bitumen. As per the tests conducted, the stiffness/ modulus of resilient for VG 40 Grade of bitumen is higher as compared to VG-30 and the modified bitumen. However, the modified bitumen performs better against exposure/ oxidation as compared to ordinary bitumen, which has been proven over the years. This fact has been endorsed by practising engineers as well as academicians. As such, considering the benefits of modified bitumen, especially against oxidization, it is always advocated by the research institute to use modified bitumen in the wearing coat.

3. As such, following have been decided to be used in the construction of National Highways: -

- (i) DBM/ BM layer - Only VG-40 Grade of bitumen shall be used for the National Highways.

- (ii) **Wearing coat (bituminous concrete)** - Modified bitumen (using polymer/ crumbed rubber/ natural rubber) or VG 40 grade of bitumen has to be used. In such cases, shearing mill is to be mandatorily used (in case of Bitumen modified with crumbed/ natural rubber) so as to ensure proper mixing of the bitumen and the modifier. Other measures should also be taken so that proper mixing of the bitumen and the modifier is ensured at the time of using the modified bitumen for construction of wearing coat.
- (iii) The source of procurement of bitumen/ modified bitumen is always a concern from the point of view of homogeneity and quality. As such, the bitumen/ modified bitumen shall be procured from the refineries only.
- (iv) In some projects, especially those related to expressways/ green-field projects and traffic more than 150 MSA, Stone Matrix Asphalt (SMA) shall be used. In cases where SMA is to be used, it should be indicated in schedule B of the RFP/ Contract Agreement.
4. These guidelines shall be applicable in case of all new projects for which bids are invited after the issue of the same. The contents of this Circular may be brought to the notice of all concerned for necessary compliance.
5. This Circular issues with the approval of the competent authority.

Yours faithfully,



(Raj Kumar)

Assistant Executive Engineer (S &R) (P&B)  
For Director General (Road Development) & SS

**Copy to:**

1. All CEs in the Ministry of Road Transport & Highways
2. The Secretary General, Indian Roads Congress
3. Technical circular file of S&R (R) Section
4. NIC-for uploading on Ministry's website under "What's new"

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