

Government of India

Ministry of Road Transport & Highways

(S&R (P&B/New Technology) Zone)

Transport Bhawan, 1, Parliament Street, New Delhi-110001

Dated: 13th February, 2023**CIRCULAR**

To

1. The Chief Secretaries of all the State Governments/ UTs.
2. The Principal Secretaries/ Secretaries of all States/ UTs Public Works Department/ Road Construction Department/ Highways Department (dealing with National Highways and other centrally sponsored schemes).
3. The Chairperson, National Highways Authority of India, G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.
4. The Managing Director, NHIDCL, PTI Building, New Delhi-110001.
5. The Director General (Border Roads), Seema Sadak Bhawan, Ring Road, New Delhi-110 010.
6. All Engineers-in-Chief and Chief Engineers of Public Works Department of States/ UTs/ Road Construction Department/ Highways Departments (dealing with National Highways and other centrally sponsored schemes).
7. All CE-ROs, ROs and ELOs of the Ministry.

Subject: - Use of Stone Matrix Asphalt (SMA) Mix in Wearing Course of Flexible Pavement-Reg.

Madam/Sir,

Over the years there has been tremendous rise not only in the traffic volume, but axle loading as well. Vehicles carrying heavy loads have specially designed tyres, which are inflated to high pressure, causing high stress as well as rutting on pavement. Under these conditions, conventional dense grade mixes have not been found suitable as a rut resistant wearing course.

2. **STONE MATRIX ASPHALT - SMA**, a gap graded mix is highly rut resistant, tough, stable, skid resistant, with high quantity of coarse aggregates, relies on stone-to-stone contact to provide strength & rich in binder, to provide durability. SMA has almost double bitumen film thickness than that of conventional Bituminous Concrete (BC) mix which makes it more resistant to top-down cracking, less susceptible to ageing and oxidation and resistance to moisture damage. Further, the stiffer modified binder as well as strong coarse aggregate skeleton with stone-to-stone contact gives resistance against plastic shear deformation i.e. rutting and shoving at high axle load in tandem with high ambient temperature. Thus, SMA is long-life durable wearing course mix and it generally requires renewal in 7-10 years. A few advantages of SMA are given below:

- a. High resistance against rutting
- b. Suitable for very high temperatures, highly stressed intersections and heavy axle load
- c. High resistance against cracking during cold temperatures

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- d. Good resistance to wear & tear
 - e. Good adhesion between aggregates and bitumen
 - f. Less bleeding
 - g. Reduced traffic noise
 - h. Better wet-weather skid resistance reducing hydroplaning, splash and spray
 - i. Better night time glare during wet conditions, and enhancing the visibility of pavement markings.
3. The following Guidelines/Specifications of SMA are published by Indian Roads Congress
- a. IRC: 37-2018" Guidelines for Design of Flexible Pavements"
 - b. IRC: SP: 79-2008 "Specifications for Stone Matrix Asphalt" along with its amendment No. 1/IRC: SP: 79/November, 2018 (Effective from the 31st January, 2019)
 - c. MoRT&H Specification for Roads & Bridge Works
4. In view of the aforementioned advantages of SMA and to avoid frequent periodic maintenance/ overlay requirements of flexible pavement, SMA may be adopted in the following conditions
- i. Average of Maximum ambient temperature of 7-days is more than or equal to 45°C; or
 - ii. Weighted Average Vehicle Damage Factor(VDF) [calculated using number and VDF of each type of Commercial Vehicle] is more than or equal to 8 and Cumulative msa for the design period is 50 or more;
5. This issues with the approval of Competent Authority.

Yours sincerely,
Bidur Kant Jha
 13-02-2023
 (Bidur Kant Jha)
 Director

(New Technology for Highway Development)
 For Director General (Road Development) & Special Secretary

Copy to:

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

Copy for kind information to:

- 1. PS to Hon'ble Minister (RT&H, MS&ME)
- 2. PS to Hon'ble MOS (RT&H)
- 3. Sr. PPS to Secretary (RT&H)
- 4. PPS to DG (RD) & SS
- 5. Sr. PPS/ PPS to Addl. Secretary (Road Safety)/ Addl. Secretary (RT&H & LA)

6. Sr. PPS/ PPS to AS&FA
7. Sr. PPS/ PPS to ADG (SKN) / ADG (RP)/ ADG(DS)
8. Sr. PPS/ PPS to JS (RT&MVL)/ JS (EIC) / JS (Logistics)/ JS (NHIDCL)

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