



**GOVERNMENT OF INDIA**  
**MINISTRY OF ROAD TRANSPORT & HIGHWAYS**  
**AN ISO 9001:2008 CERTIFIED MINISTRY**  
**SR&T(R) ZONE**

**F. No. RW/NH-33044/10/2002/S&R (R)**

**Dated: 11<sup>th</sup> January, 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-110 010.
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: Guidelines for implementation of Hot in place Recycling Technology for Periodic renewal (PR) works.**

Ministry's letter of even number dated 26<sup>th</sup> September 2002 and letter No.RW-22012/01/2012-Mech. dated 18<sup>th</sup> December, 2012 stipulates detailed criteria/guidelines for selection of stretches of National Highways and Specifications to be adopted, inter alia, for Periodic Renewal works. The periodic renewal of bitumen pavement is required to attend the surface cracks developed on the flexible pavement and also to overcome the effect of oxidation of bitumen. Periodic renewal using virgin bitumen and virgin aggregate increase our dependence on limited natural resource i.e. crude oil and aggregate. Moreover, about 50% of cost of renewal of pavement is material cost. As such, emphasis needs to be given to recycle the existing pavement.

2. The recycling technology would also help in addressing the environmental issues due to lower demand of fuel, bitumen and aggregates. The economic benefits of using recycling technology includes the reduction of the material cost as well as reducing the costs associated with the transportation of materials to the work site.

3. Accordingly, in supersession of all previous guidelines/instructions of the Ministry in respect of periodic renewal, it has now been decided that Hot in place recycling is to be preferred over the conventional surface renewal (laying new bituminous concrete). Just to



begin with and to equip more and more contractors capable of taking recycling work, at least 25% of the stretches to be sanctioned for PR should be with Hot in place recycling technology. However the stretches falling in hilly terrain and in North East or in other difficult terrain may be excluded for taking up hot in place recycling. Effort should be made to select continuous long stretches for hot in place recycling with a minimum stretch of 10 km. Recycling Technology should be in conformity with this circular, Ministry's Specification for Road and Bridge Works (Fifth Edition) and IRC:120-2015.

4. The following criteria/guidelines are suggested for identifying stretches of National Highways to be renewed with Hot in place recycling and Specifications to be followed:-

**A. Criteria/guidelines for Hot in place recycling:**

- i. The defect/distress is confined only to surfacing/wearing course.
- ii. The condition of the pavement is fair as assessed in accordance with IRC:82-2015. However, the pavement which is poor but have stable structural foundation may also be considered for recycling.
- iii. Structural capacity/residual life of pavement should be sufficient to take wheel load repetition/traffic for at least 5 years. Structural evaluation of pavement should be carried out with Falling Weight Deflectometer in accordance with IRC: 115-2014.
- iv. Existing geo-synthetics can cause a hindrance in milling process; and as such existing pavement should be selected wisely considering the depth of geo-synthetics laid earlier.
- v. The properties of bitumen and aggregate on existing pavement are to be assessed.
- vi. Projects with multiple crack seal coats and patchwork repairs should be avoided.

**B. Specifications:**

- i. The Hot in place recycling is to be carried out for a maximum depth of 50 mm.
- ii. Depending upon the condition of the existing pavement surface, the Hot in place recycling may be carried out by following processes:-
  - (a) Surface Recycling : Mainly bitumen and rejuvenator is to be added on the existing surface to be hot milled before mixing, spreading and re-compacting.
  - (b) Remixing: In addition to bitumen rejuvenator, aggregates are also added so as to get the desired design mix by using Hot in place recycling.
  - (c) Repaving: The top layer of the existing pavement is recycled and improved just as in the remixing process. A new layer of conventional bituminous layer concrete is immediately placed over the recycled pavement and both lifts are compacted together with the same compaction equipment.
- iii. The rejuvenator and virgin bitumen is to be added so as to get the combined properties of the binder matching the required properties of bitumen.



- iv. Aggregate grading of the reclaimed material has to be determined and the missing fractions have to be added to arrive at the appropriate grading as per MORTH Specification.
  - v. The recycled mixes should meet the same requirement as of bituminous concrete laid by using fresh/virgin bitumen and aggregates.
5. To ensure consistent and quality work, the defect liability period for such work may be fixed as 4 years.
6. All the agencies/ contractors would require to obtain necessary/statutory clearances such as registration of the equipment, pollution etc from the concerned government authorities, clearance from PESO (Petroleum Explosive Safety Organisation), Ministry of Petroleum & Natural Gas. Contractor will ensure safety of the operating staff.
7. All the executive agencies would be required to regularly monitor the performance of the stretches improved using Hot in place recycling technique. The feedback in respect of investigation of the existing stretches considered for Hot in place recycling, selecting the design mix and also on the performance are to be regularly reported to the Ministry so as to further refine/improve the guidelines in this regard.
8. In case, Ministry appoint some agency/academic institute for monitoring the performance of Hot in place recycled stretches including procedures to be followed for selection/design of the mixed etc., all executive agencies would be required to provide necessary details/support to the agency/academic institute.
9. All the executive agencies should strictly adhere to this circular.

Yours faithfully,



(Md Shadab Imam)

Assistant Executive Engineer (S, R&T) (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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