

No. RW/NH-33054/20/88-DII

Dated, the 10th May, 1989.

To

The Chief Engineers of States and UTs dealing with NHs and other Centrally Financed Schemes, Director General (Works), CPWD, Director General (Border Roads).

Subject: Provision of Paved Shoulders on National Highways - Guidelines regarding:

Road shoulders, properly built and well maintained, not only lend structural support to various layers of pavement, but also provide additional space for overtaking maneuvers, parking of disabled vehicles, and movement of slow moving vehicles such as scooters, two/three wheelers and bicycles. In this manner, shoulders help to reduce accidents and increase road capacity. On the other side, shoulders in poor shape, i.e. those having deep ruts or deformed profile constitute a traffic hazard besides affecting pavement performance to an appreciable degree, thereby increasing the total transportation cost.

## 2. Criteria for Paved Shoulders:

2.1 To get capacity benefit from shoulders, especially under mixed traffic conditions, it has been decided that subject to availability of funds, 1.5 metre wide paved shoulders may be provided on either side of two-lane National Highways in plain/rolling terrain in a selective manner. As regards four-lane sections, it is already in policy of the Ministry to construct paved shoulders in conjunction with the four-laning.

2.2 While initiating proposals for paved shoulders on two-lane sections, the following criteria should be kept in view:

- (i) The present traffic on NH should be generally around 10,000 PCUs, or more.
- (ii) The traffic should consist of sizeable percentage of slow moving vehicles.

2.3 Apart from above, provision of paved shoulders could also be considered when:

- (a) the concerned section is located in or near an urbanised area with considerable local traffic, or
- (b) a stretch is particularly accident prone mainly due to lack of paved width for overtaking and passing manoeuvres.

2.4 Final selection of lengths would be according to priority given to each section on the basis of traffic intensity and/or safety considerations and overall availability of funds.

## 3. Thickness of Paved Shoulders:

3.1 As far as practicable, paved shoulders, when constructed simultaneously with the central pavement, should have the same thickness as pavement of the main carriageway (see Fig.A). In the case of old NHs where the crust composition and thickness is variable and not well defined shoulder thickness could be fixed in an ad-hoc manner (see Fig.B) otherwise it would be as in Fig.A. Typical design of a paved shoulder will thus consist of:

- (i) A suitable thickness of granular sub-base with the bottom 150 mm portion preferably extended over the full formation width to ensure efficient drainage.
- (ii) A base course of Water Bound Macadam (WBM) or Wet Mix Macadam (WMM) in three layers of 75 mm each, with the top layer being primed; and
- (iii) A bituminous wearing course consisting of 2 coats of surface dressing, premix carpet, concrete mix seal, or semi-dense bituminous concrete carpet. The texture of the shoulder wearing surface should be different from the main carriageway to ensure clear contrast between them.

## 4. Shoulder Cross-section:

4.1 Typical cross sections of a National Highway with paved shoulders are shown in the enclosed sketches (Figs. A & B).

4.2 The paved shoulders should invariably be flanked by one meter wide earth berms. When feasible, the berms may be made of granular materials.

## 5. General Considerations:

5.1 Paved shoulders should not be provided in a piecemeal manner without giving due consideration to other improvements on the road section in question in the near future. Desirably, the construction of shoulders should be taken up in homogeneous sections and preferably together with strengthening of the main pavement.

5.2 Simultaneous with the provision of paved shoulders, narrow cross drainage structures in the concerned section must also be widened to full formation width.

5.3 The carriageway and paved shoulders must be distinguished from each other by continuous yellow edge line marking.

## 6. Construction Sequence:

6.1 Where the paved shoulder is to be provided by the side of an existing carriageway, the sequence of construction shall be (i) strengthening of the pavement if envisaged, (ii) construction of shoulder on one side of the carriageway including earthen flank, and (iii) construction of shoulder on the opposite side. Step (iii) will be proceeded with only after step (ii) is completed.

6.2 In the case of new road construction, pavement and paved shoulders on both sides of carriageway should be constructed simultaneously in corresponding layers.

7. It is requested that the contents of this circular may please be brought to the notice of all concerned for compliance. The feedback on the experience with paved shoulders will be welcome.