

No.RW/NH-33019/1/91***Dated, the 10th March, 1993*****To**

The Chief Engineers of all State PWDs and Union Territories dealing with Roads; Chairman, National Highway Authority of India; Director General (Works), Central Public Works Department; Director General, Border Roads Development Board

Subject: Ensuring proper pavement drainage on National Highways

As practising Highway Engineers are aware, provision of adequate drainage is a primary requirement of protecting and maintaining the embankment and shoulders of a road and ensuring the functional efficiency at all times. The protection of the pavement and the subgrade against damage due to water forms a very important part of the above. If the threat to road pavement from moisture-related damage is not recognised in time and corrective measures taken, the improvement work done for any highway may soon be wasted by recurrence of such damage. In view of this, at the time of framing proposals for improvement of any National Highway, the entire drainage aspects of the road pavement must be studied in detail and necessary measures for ensuring proper drainage incorporated in the technical proposals/estimates without fail. The general misconception that all aspects of drainage have been taken care of with the provision of routine C.D. structures along the route has to be avoided.

2. In order to ensure compliance with the above, it has been decided that following requirements must be satisfied for any road improvement proposal submitted to the Ministry for approval. A check list giving detailed information on the following points should invariably accompany the proposal.

A. FOR NEW CONSTRUCTION

- (i) A general description of the road drainage plan and provision proposed alongwith locations of cross drainage works.
- (ii) Broad hydraulic calculations to fix number, waterway, deck level etc.
- (iii) Information regarding highest ground water table and highest flood level on longitudinal section of the road.
- (iv) A certificate to the effect that :
 - a) Proposed subgrade level is kept generally one meter above the design HFL at all places so that no part of the road will get submerged or overtopped due to flood waters; and
 - b) Where waterlogging conditions prevail, it has to be certified that after careful examination of all the involved factors, the top of the embankment has been kept at a level adequately above the ground water table so that the subgrade does not get saturated due to capillary action and other measures such as deep drains, capillary cutoffs etc. as per the guidelines in IRC:34-1970 "Recommendation for Road Construction in Water-logged Areas" have been provided.
- (v) In fixing design HFL, care must be taken for possible rise in water level due to such factors as the embankment of the road itself, provision of the waterway at bridges and culverts and gradual rise in water level because of subsequent siltation of the drainage courses.
- (vi) Details of drainage arrangement proposed at special locations like junctions, superelevations etc.
- (vii) Details about proposed road side drains such as detailed plan showing exact locations and levels vis- a-vis the centre line of highway, discharge points at nullahs/water courses, gradients, outfall levels at discharge points, cross section lining etc.
- (viii) Information regarding suitable measures proposed for surface drainage of pavement, central median, shoulders and high embankments.

B. STRENGTHENING/WIDENING

- (i) A general description of the existing drainage condition of the road.

- (ii) Information regarding existing cross drainage structures such as locations, waterway, HFL, deck level condition (weather weak or narrow), adequacy of waterway etc.
- (iii) Proposal for reconstruction/widening of weak/narrow culverts.
- (iv) Details of stretches of existing road which are getting submerged or overtopped and necessary proposal for raising of the road/provision of additional cross drainage structures.
- (v) Details of stretches having water-logged condition and necessary proposals for improvement.
- (vi) A certificate to the effect that the entire road drainage aspect has been considered in detail during preparation of the project proposal. It shall also be certified that the road stretches where strengthening has been proposed are not subject to overtopping by flood waters and where it is not so, adequate provisions have been made to ensure prevention of overtopping, waterlogging and damage to embankment, subgrade, shoulder, pavement and CD stretches due to insufficient drainage provisions.
- (vii) Details of drainage arrangement proposed at special locations like junctions, superelevations etc.
- (viii) Details about proposed roadside drains such as detailed plan showing exact locations and level vis- a-vis centre line of the highway, discharge points at nallahs/water course, gradients, outfall levels at discharge points cross section, lining etc.
- (ix) Information regarding suitable measures proposed for surface drainage of pavement, central median, shoulders and high embankments.

3. It is requested that the contents of this letter may please be brought to the notice of all concerned officers in your organisation for strict compliance, in respect of all NH works.