

**Government of India**  
**Ministry of Shipping and Transport ( Roads Wing )**  
**Transport Bhavan, 1, Parliament Street,**  
**D/- 10-9-1974.**

**No. PL-50(12)/T4-SP.**

To,

The Chief Engineers of all State Public Works Depts.  
And Union Territories dealing with roads.

Sub : Special steps to prevent soil erosion in hilly areas in the context of overall soil conservation measures in the country.

Sir,

The need to conserve and built the country's land and soil resources, so that these serve the present as well as future generation has assumed paramount importance in the wake of developing shortage of tillable land and water resources. Unglanced road construction in hilly areas has become identified as one of the causes contributing to loss of these resources.

2. By its very cature, road construction in hills is a destructive process for the strata of the hill side at least in the initial stages, road cutting through areas otherwise not susceptible to land slides normally disturb the natural inclination of the soil in such a way as to create conditions for large scale land slides in the first few users after construction. Even dense forests are not immense from this problem. With the removal of vegetation cover, destructive action of water gets further pronounced and acceleration as the process of soil erosion and formation of deep gullies. End resurl of this is that enormous quantities of soil and rock move down the rivers, lakes and finally to the sea.

3. It is, therefore, necessary that care is taken during road construction as regards planning of works and treatment of the catchment area of drainage so that soil erosion is prevented as far as possible. To combat this problem, the following measures are especially commanded for adoption on National Highways as well as State Roads.

- i) Roads should not be located through geologically unstable strata if this can be avoided.

- ii) Road alignment should avoid large scale cutting and filling and follow the lie of the land as far as possible. Use of tunnels to avoid deep cuts should be considered where feasible as also economically.
- iii) Where necessary, provision of brest walls of suitable design should be considered to help achieve stability of the hill cuttings.
- iv) To the extent feasible, roads should be aligned away from streams and torrents except where those are to be crossed. Since the greatest damage always occurs along water courses, special attention is necessary to create protection belts of forests of both sides.
- v) Drainage of water from the road side must be given top attention and necessary system of drains constructed to lead the runoff to natural water courses. In particular, suitable interceptor and catch water drains must be provided above the cut slopes for speedy and safe disposal of rain water.
- vi) Excavated material should not be thrown haphazardly but dumped at suitable place where it cannot get easily washed away by rain. It is, therefore, otherwise expected as a normal requirement of hill road design that the cross section is either wholly in cutting or partly in cutting and partly in filling so that with the adoption of retaining walls of a suitable type the cutting spoils can be utilised to the extent possible, guided of course by consideration of economy and best road stability.
- vii) Depending on the availability of land and other resources afforestation of road side land should be carried out to a sufficient distance on either side of the road. The selection of plant species will depend on climate. Altitude and soil conditions but reference should be given to deep rooted trees and plants. For preparing the detailed scheme of afforestation, persons having knowledge of soil conservation or forestry should desirably be associated.
- viii) Vegetation cover should be established on all cut/fill slopes through any one of the techniques described in I.R.C. Standard Treatment of Embankment slopes for Erosion Control ( under print ). The activity of establishing vegetation on barren slopes should be treated as part of the regular maintenance appertains on all hill roads.

It is requested that necessary action may be taken on the above suggestions under intimation to this Ministry. This Circular may please be brought to the notice of all Officers in your Department engaged on road works in the hilly terrain, as also to other State Institute dealing with road construction such as Zilla Parishad Rural Engineering works Organisations , Forest Department, Irrigation and Power Department authorities etc.

Yours faithfully,

sd/-

( J. S. Marya )

Director General ( Road Development ).

