

"TASK FORCE CERTIFICATE"

- 1- Lay out of the Land be followed as possible.
- 2- Heavy cutting filling be avoided as far as possible the technology of cut and fill method is to be adopted. Steep hill slopes also to be avoided.
- 3- Unstable slide- prone areas to be avoided. For identifying such areas the advice of Geotechnical engineers and geologists to be taken during the survey for alignment.
- 4- A comparison of various possible alignments with reference potential be made and the alignment involving minimum crosion risks be preferred.

Apart from the stage of planning the road alignment, effective steps are also required to be taken by ground engineer during the process of roads. Broadly the measures to be taken have been identified as:-

- 1- Cut and fill method to be adopted while excavating for road formation and heavy earth cutting is to be avoided Box cutting is to be avoided to the extent possible.
- 2- Blasting by explosives is to be restricted to the minimum. Lay out of holes to be drilled for blasting is to be planned. Keeping in view the line of least resistance and the existence of joints. Controlled blasting should be repeated using low charge and care be taken to avoid activating slide zones or widening fissures and cracks in rocks. Use of delay detonators in large scale blasting work is to be made for an online dispersion of chock waves. So that minimum disturbance is caused to the rock stratum as result of the blasting process.
- 3- All cut slopes. Unstable hill side and slide prone crosion prone areas are to be provalued with suitable correction measures by using one or the other of the techniques developed be CRRRI like sample vegetative Turing. Bitumen much treatment and slide treatment by Jute netting these simple vegetaive Turing seams to be the most appropriate preventive measure in many situations. This should be established in the dandified slopes immediately after the excavation is made.
- 4- adequate drainage measures and protective structures like intercepting catch water drains, longitudinal drains culverts, breast walls retaining and the walls are provided for purposes of establishing the slopes. Growth vegetative cover is stimualte in the disturbed hill slope above the road level by planting suitable fast growing shrubs and plants in certain selected unstable areas terraced Afforestation has also been protected as a stablised measure with good results.

Over the past few years the roads wing of the Ministry of Shipping and transport has issued instruction laying down broad guidelines and check list of the preparation of road construction projects which provide an in built mechanism for tacking land shadow erosion control for the guidance and follow up action by engineers of state 'PWD', Border Roads Organisation and others engaged in construcion of hill roads these should be observed

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