

**RECOMMENDED  
PRACTICE FOR BORROWPITS  
FOR  
ROAD EMBANKMENTS  
CONSTRUCTED BY  
MANUAL OPERATION**



**THE INDIAN ROADS CONGRESS  
1977**

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*Published by*  
**THE INDIAN ROADS CONGRESS**  
**Jamnagar House, Shahjahan Road**  
**New Delhi-110011**  
**1977**

Price Rs. 40.00  
(plus Packing & Postage)

IRC : 10-1961

First published in August, 1961

Reprinted in December, 1967

Reprinted in April, 1977

Reprinted in July, 2001

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Printed at M/s Dee Kay Printers, New Delhi-110015  
(500 copies)

## **RECOMMENDED PRACTICE FOR BORROWPITS FOR ROAD EMBANKMENTS CONSTRUCTED BY MANUAL OPERATION**

### **1. INTRODUCTION**

1.1. Large quantities of earth are sometimes needed for making road embankments. If this earth is not borrowed according to a well considered plan, the borrowpits may endanger the stability of the embankment itself ; they may result in stagnant pools of water giving rise to the breeding of mosquitoes and the spread of malaria ; they may mar the beauty of the landscape along the road ; and under certain circumstances they may even lay waste large areas of good agricultural land. The Specifications and Standards Committee of the Indian Roads Congress has laid down the following principles for the location, depth and drainage of borrowpits so that the bad effects of borrowpits may be kept down to the minimum.

### **2. SCOPE**

2.1. These rules are recommended for adoption on all types of roads in the country on which earthwork for road embankments is done by manual operation.

### **3. NORMAL ROAD EMBANKMENTS**

3.1. As far as possible no borrowpits should be dug on road-land. Before deciding to dig borrowpits on roadland, earth for the embankment should be obtained :

- (i) from cuttings for nearby sections of the road ;
- (ii) from excavation for improving sight distances at nearby curves ;
- (iii) by sectioning an adjacent nallah or waterway where necessary ;
- (iv) by excavating cuts to lead drainage water away from the road ;
- (v) by excavating side drains and catch-water drains ;

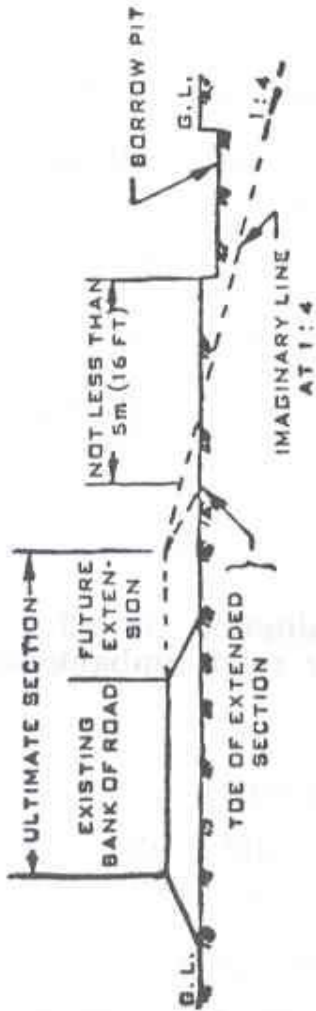
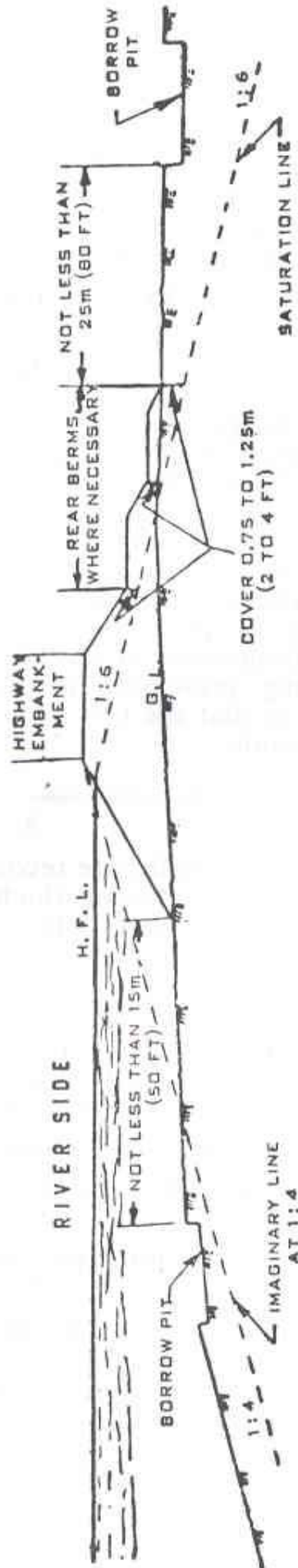


FIG. 1



RECOMMENDED PRACTICE FOR BORROW PITS FOR ROAD EMBANKMENTS

(NOT TO SCALE)

FIG. 2

- (vi) from wasteland outside the roadland ;
- (vii) from humps above the general ground level within the roadland ;
- (viii) by excavating tanks ;
- (ix) from land acquired temporarily outside the roadland ;
- (x) from soil mounds resulting from the digging of wells and lowering of fields in the vicinity of the road.

3.2. Borrowpits should be rectangular in shape with one side parallel to the centre line of the road. If on roadland, they should be dug as near the road boundary as possible.

3.3. No borrowpits should be dug within 5 metres of the toe of the final section of the road embankment, after making due allowance for future development (See Fig. 1).

3.4. The depth of borrowpits on the roadland will depend on the amount of soil needed to form the embankment after utilising other sources as mentioned in para 3.1. The depth should, however, be so regulated that the borrowpits do not cut an imaginary line having a slope of 1 in 4 projected from the edge of the final section of the bank (See Fig. 1).

3.5. Borrowpits should not be dug continuously. Ridges of not less than 8 metres width should be left at intervals not exceeding 300 metres. Small drains should be cut through the ridges, if necessary, to facilitate drainage.

3.6. To prevent malaria, where other conditions permit, borrowpits should be well drained. To ensure efficient drainage, the bed level of the borrowpits should, as far as possible, slope down progressively towards the nearest cross drain, if any, and should not be lower than the bed of the cross drain.

3.7. When it becomes necessary to borrow earth from temporarily acquired cultivable lands, the depth of borrowpits should not exceed 45 cm. The top soil to a depth of 15 cm should be stripped and stacked aside. Thereafter soil may be dug out to a further depth not exceeding 30 cm and used in forming the embankment. The top soil should then be spread back on the land. It is most important to adopt this practice when soil is borrowed from rich cultivable land.

3.8. In waterlogged areas where the water table is near the surface, the lowering of the level of the land even by 30 cm which will result from the practice suggested in para 3.7, may make

cultivation impossible. In such cases borrowpits should take the form of deep narrow continuous ditches (connected with natural drainage where possible) so as to conserve as much land as possible\*. In all such cases special anti-malaria measures may have to be adopted near habitations, in consultation with Public Health Authorities.

3.9. Borrowpits should not be dug within 0.8 km of towns or villages. If unavoidable they should not exceed 30 cm in depth and should be drained.

#### 4. ROAD EMBANKMENT AS A FLOOD BANK

4.1. **Borrowpits on the river side :** All earth for the embankment should be borrowed, as far as possible, from the river side. The inner edge of any borrowpit should not be less than 15 metres from the toe of the bank, the distance depending upon the magnitude and the duration of the flood to be withstood (See Fig. 2). The borrowpits should comply also with the requirements of para 3.4.

4.2. **Borrowpits on the rear or landside :** Ordinarily no borrowpits should be dug on the landside. Where this cannot be avoided, a berm at least 25 metres wide should be left between the borrowpit and the toe of the bank. On sloping grounds, borrowpits should be dug on the higher side, as far as possible.

The toe of the bank on the rear side should have a cover of 0.75 metre to 1.25 metre over the saturation line drawn at a slope of 1 in 6 from the high flood level on the river side. (See Fig. 2). The depth of the cover will depend on the magnitude and the duration of the flood to be withstood. Where necessary, rear berms may be provided to give the minimum cover over the saturation line, as shown in Fig. 2. The slope of 1 in 6 would be found suitable in most cases. In special cases, the slope of the saturation line should be determined with reference to the nature of the soil.

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\* In locations like those peculiar to West Bengal, these continuous ditches may take the form of water channels to be used for inland navigation.