

**No.RW/NH-34015/2/86-S&R*****Dated, the 22nd June, 1994***

To

Chief Engineers of all State PWDs/UTs. (dealing with National Highways and other Centrally Sponsored Projects); Director General (Works), Central Public Works Department; Director General Border Roads; Chairman, National Highway Authority of India

Subject: Guidelines regarding approach slabs for bridges

Approach slabs are provided to attain a smooth transition for the traffic from the flexible road pavements supported on compressible earthfill to the rigid surface of the bridge. As per practice, these are generally 3.5m long in R.C.C. having width equal to the width of the bridge between the edge kerbs/ footpaths with one edge supported on the dirt wall of the abutment and the remaining portion resting on the compacted backfill. However, it is seen that a number of approach slabs constructed in the past had failed because the supporting fill behind the abutment settled excessively and non-uniformly after the construction of the approach slab. The main reason for this is inadequate compaction because the rollers as employed for compaction of the earthfill cannot go immediately behind the abutments/returns due to fear of damages to the structure. However, it is also seen that in a number of cases the fill behind the abutments has not settled excessively and the approach slab continues to serve the desired purpose without showing signs of distress. This Ministry has considered various aspects regarding this issue and the following comprehensive guidelines with regard to the approach slabs are circulated with the aim of evolving a reliable mechanism which will ensure that the fill behind the abutments/returns gets adequately compacted before the approach slab is laid and the stability of the approach slab is ensured.

2.1. Filling behind the abutments should be done in stages to keep pace with the constructions of the abutments and return/wing walls and the operation of filling should not wait for the completion of the same. This may enable the roller to approach close to the abutments, returns and ensure better compaction of the fill. However, if it is found difficult for normal rollers to approach close to the abutments/returns, the use of small vibratory rollers/plate compactors/power rammers may be made.

2.2. The approach slab should be laid only after the passage of two rainy seasons after completion of the bridge and opening of the same to traffic so that the fill behind the abutments will get additional compaction due to the traffic and the rains and this will ensure that no large settlement will take place after the laying of the approach slab. During this period care may be taken to make up any settlement immediately behind the abutment so as to maintain a smooth profile.

2.3. The approach slab may not be a part of the bridge estimate. It is suggested that the provision of the approach slabs for a few bridges in a particular division of the PWD can be combined together and projected as a separate estimate or a special repair estimate.

2.4. The approach slab shall be 300 mm thick and have a minimum length of 3.5m constructed as a RCC slab having M25 concrete for moderate conditions and M30 for severe condition of exposure. One end of the approach slab should be resting on a rear projection (Bracket) from the ballast wall of the abutment. The approach slab shall be provided with HYSD bars of 12mm dia at 150mm centre to centre both ways at top and bottom. Typical details of the bracket may be seen in Fig. 3. As levelling course and base slab a 150 mm thick layer of M15 grade concrete may be provided under the approach slab as shown in Fig. 1.

2.5. The expansion joint to the bridge shall be provided between the ballast wall and the deck (Fig.1).

2.6. In the joint between the approach slab and the ballast wall bituminous joint filler with joint ceiling compound may be provided.

2.7. The wearing coat as provided over the bridge should be extended over the approach slab also (Fig.1.)

2.8. If the road approach is completed first then the embankment in approaches shall be finished as indicated in Fig.2a. On the contrary if the bridge construction is completed first then the immediate embankment behind the abutment shall be finished as indicated in Fig.2b.

2.9. Filling behind the abutment and proper compaction of the embankment below the approach slab should be carried out by the Bridge contractor and not the contractor for the approach roads if the two contractors are different. As a general policy the construction of the embankment for an average distance of "H+10"m (the hatched portion) behind the abutment shall form part of the bridge contract (see Fig.2a and 2b) where "H" denotes the height of the embankment.

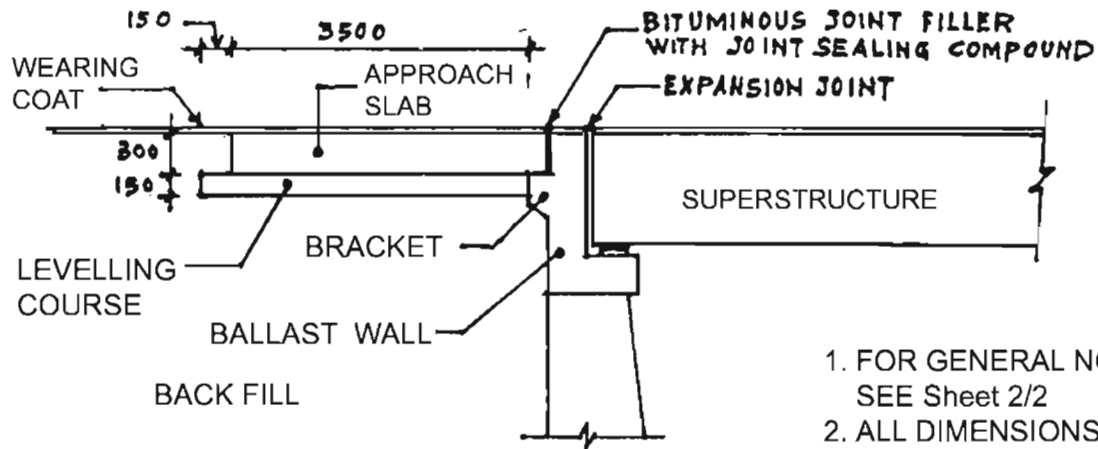
2.10. The filling immediately behind the abutment shall be carried out with selected material as per the specifications given in IRC:78 (Appendix-6).

The above guidelines supersede all the previous instructions on the subject.

### Enclosure to Ministry's Circular No. RW/NH/34015/2/86-S&R Dated 22nd June, 1994

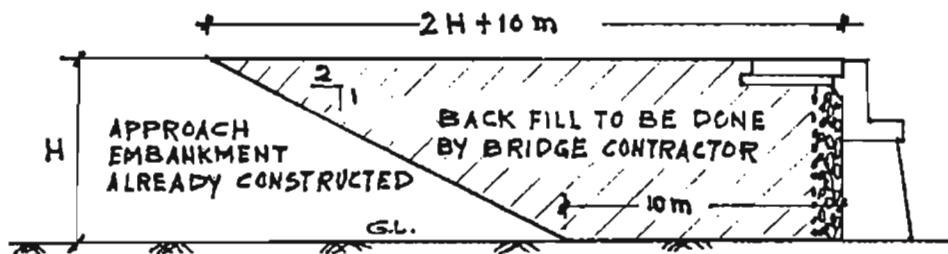
#### Note :-

1. The fill behind abutments, wing/return walls shall conform to the specifications given in Appendix 6 of IRC:78.
2. Back filling shall synchronise with the construction of abutments, wing/return walls.
3. The backfill shall be properly compacted in layers as per specifications.
4. The width of approach slab shall cover the carriageway width between the kerbs/footpaths.
5. Grade of concrete :-
  - (a) Approach slab :  
M25 grade for moderate exposure.  
M30 grade for severe exposure
  - (b) Levelling course:  
M15 grade
  - (c) Ballast wall including supporting corbel:  
as per design
6. Clear cover to any reinforcement 50 mm unless specified
7. While working out the thickness of ballast wall, care may also be taken to see that anchorages of expansion joints can be accommodated easily therein.
8. In Fig.3, the nominal design vertical reinforcement on the earthface of the ballast wall may be increased by 50% in the region 'X' to resist increased tensile forces due to non-linear stress pattern above the bracket.

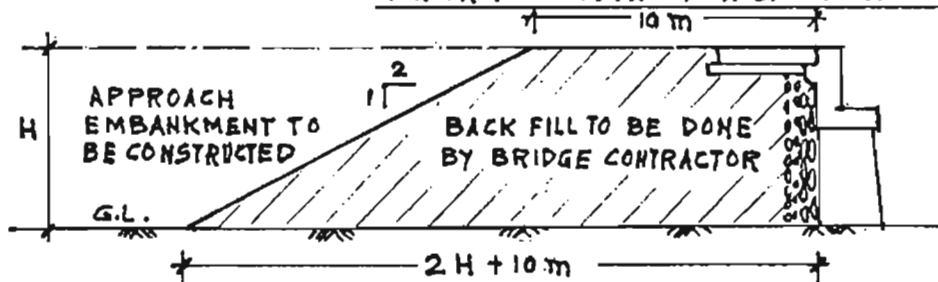


**FIG. 1**

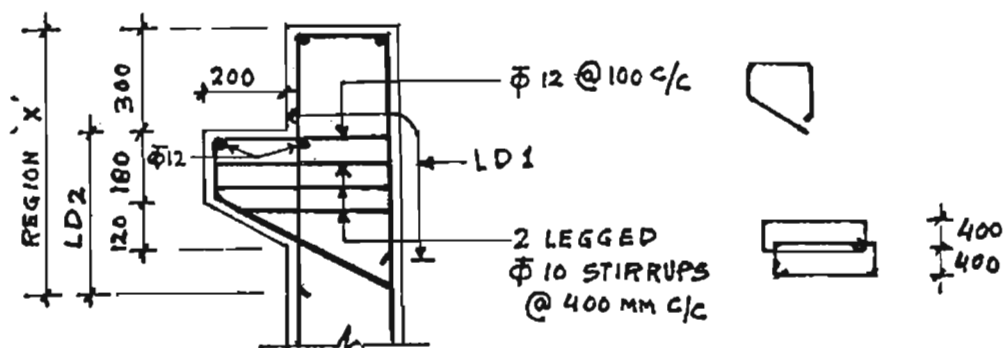
1. FOR GENERAL NOTES SEE Sheet 2/2
2. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED



**FIG. 2 (a) CASE-I APPROACH EMBANKMENT CONSTRUCTED PRIOR TO CONSTRUCTION OF ABUTMENT**



**FIG. 2 (b) CASE-II ABUTMENT CONSTRUCTED PRIOR TO CONSTRUCTION OF APPROACH EMBANKMENT.**



**FIG-3 REINFORCEMENT IN BRACKET**

LD<sub>1</sub> = BOND LENGTH FOR BRACKET REINFORCEMENT  
LD<sub>2</sub> = BOND LENGTH FOR BALLAST WALL REINFORCEMENT



**FIG-4 REINFORCEMENT ON APPROACH SLAB**