

MAINTENANCE OF FLOOD EMBANKMENTS

4.00 MAINTENANCE OF FLOOD EMBANKMENTS

4.1 Proper maintenance of embankments is extremely important as breaches in these can be disastrous and can cause even greater damage than the inundation by the floods from rivers where no embankments are provided. Very careful maintenance of the embankment is necessary during high waters. Frequent inspections and constant attendance by all concerned is essential particularly in case of new embankments or dangerous section of old embankments. The establishment required for proper upkeep and maintenance of an embankment will vary according to its importance as also the behavior and discharge of the river.

Patrolling :-

Patrolling should commence as soon as water comes against an embankment and should continue until water finally leaves the embankment. When the river is in floods, the embankment requires close and constant watching and unremitting supervision both by day and night by adequate trained staff.

Wave-Wash :-

During the bad storms erosive wave action takes place which sometimes erodes/washes the soil on slope of earth embankment resulting into wave-wash. Short grass and small thick bushes like pilchi, lai etc. growing on the embankment is good protection against erosion and wave-wash.

Leaks :-

Water coming out through the body of embankment in any form such as seepage through cracks or piping action may be termed as leak. Rodents and other borrowing animals make holes, cavities and tunnels through and under an embankment. These are a source of danger as very often these causes leaks and excessive seepage and even serious breaches during flood periods.

Breaches :-

Failure of a section of earth embankment due to over-topping causes breach of section. Successive and heavy rains cause very often severe erosion of unprotected slopes and render the section unsafe. This may result in disastrous breaches. In case of such emergencies the top and sides of particularly weak and dangerous sections of freshly made up earth should be protected by materials sand bags etc.

The materials required during monsoon period to meet the situation is given vide **Annexure : 4A**

ANNEXURE - 4-A

Materials required during monsoon period should be provided in ample quantity as experience shows them to be necessary. Particular care should be taken that there is an adequate quantity of the required materials distributed with carefully forethought so as to be readily available every where, particularly at dangerous sites. The quantity of materials required depends on importance or dangerousness of the embankment line and the distances of the embankment from the nearest stations at which there can be purchased. Adequate provision should be made at the discretion of the Superintending Engineer of the Circle Office. The following scale of materials prescribed for one Circle, is an indication of the relative quantities of the different kinds of materials usually required during monsoon period.

1. Patrolling

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|--------|------------------------|---|
| (i) | Lamps Hurricane | 1 For every 2 Labours.
1 For every Work Assist/Karkoon.
1 For every A.E/A.A.E./Overseer.
and 20% of the Total for Spare. |
| (ii) | Wicks | 9 Nos. per Lamp. |
| (iii) | Globes | 1 No. spare for each Lamp. |
| (iv) | Burners and Caps | Spare for 1/3 No of Lamp. |
| (v) | Torches | 1 No. for Executive Engineer.
1 No. for Dy. Executive Engineer.
1 For every A.E/A.A.E./Overseer.
and 2 Nos. for Spare. |
| (vi) | Cells | 1 Fill and Two Spare sets. |
| (vii) | Petromax Lamps. | At dangerous places as necessary; each lamp with 2 spare Globes, 2 Nozzles, 2 Washers, 2 Wire Gauzes, 2 Needles and 6 Mantles.(3/4 of the members should be 300 C.P. and 1/4th 200 C.P. |
| (viii) | Fuel for Lighting Fire | To be collected by labour establishment. |
| (ix) | Kerosene & Oil | 1 Tin per hurricane Lanterns (Excluding Spare) and 2 Tins for Petromax lamp per season. |
| (x) | Match Boxes | One Dozen per Lamp per season. |
| (xi) | Spirit | 1 Bottle per petromax lamp per Season |
| (xii) | Funnels | ½ Dozen per Work Assistant / Karkoon |
| (xiii) | Oil Extractors/Caps | ¼ Dozen per Work Assistant / Karkoon |
| (xiv) | Spirit Cane | 1 per Petromax. |

2. Wave – Wash

- (i) Lai fascines or any other mattress made up of split bamboos or “pilchi” or any other locally available materials. Material for providing light longitudinal Groynes sewed with compactly woven pilchi or split bamboos etc.
- (ii) Munj rope of lengths to be provided with fascines 11 Kg/Km.

3. Leaks

- (i) Gunny Bags
 - (a) Where High Flood Depth is less than 1.80 Mt and the embankment is generally safe then 65 Bags per Kilometer.
 - (b) Where High Flood Depth is greater than 1.80 Mt. or the embankment is known to give trouble of leaks then 130 Bags per Kilometer.
- (ii) Stakes 65 to 130 Stakes per Kilometer.
- (iii) Baskets 1 Basket of Toot per labour or 1 Basket of lai per labour. and One Spare.
- (iv) Sutli 450 gms. Per 100 Bags.
- (v) Needles ½ Dozen with each Work Assistant.
- (vi) Sand Collection of 1.80 to 3.60 Cu.Mt.Per every Kilometer for Dangerous Lengths.

4. Breaches

Provision for materials required should be made for One or More small breach length each 76 Mt. long depending upon the embankment.

Materials for protecting ends of one breach and constructing one 76 m. long ,4 rows are as under

- (i) Big stakes or Sal Ballies Every 1.50 Mt. apart with 100% spare.
- (ii) Split Sal Ballies or Bamboos. For Horizontal bracing of Vertical ballies – 3.0 Mt. long each for the entire length.
- (iii) Split Sal Ballies or Bamboos. For Cross bracing of vertical ballies – 3.0 Mt. long One for each vertical ballies.
- (iv) Mattresses of split bamboos or “Pilchi” or other locally available material. For sufficient length.

(v)	Brushwood of local material	For sufficient length.
(vi)	Stakes	0.45 Mt. centre long each row of frame.
(vii)	Munj Rope	Enough quantity
(viii)	Coir Rope	Enough quantity
(ix)	Gunny Bags	2500 Nos. for every A.E/A.A.E./Overseer.
(x)	Sutli	450 gms. Per 100 Nos. Bags.
(xi)	Needles	1 No. per 100 Nos. Bags.
(xii)	Baskets	500 Nos. per Ordinary Sub Division, and 1000 Nos. for Sub Divisions with dangerous Embankments.