

No. NH/20017/7/90-PL

Dated the 18th June, 1992

To

The Chief Engineer of State PWDs/UTs dealing with National Highways & Centrally Aided Road Projects;
Director General Border Roads; Director General (Works), CPWD.

Subject: Measures to be taken in the event of disruption of traffic on account of damages to roads, bridges and bridge approaches due to floods.

In many States, there are stretches of road passing through areas prone to frequent floods during the monsoon season. In order to keep the road damages to the minimum on this account, certain amount of advance preparedness is necessary before every flood season. In vulnerable road stretches, which would be well-known to the local field engineers maintaining the roads, require to be clearly identified in advance and a separate list maintained about these.

2. From time to time, the Ministry has issued a number of useful circulars underlining the measures to be adopted for mitigation of adverse effects of floods, arrangement of diversion during floods and actions to be taken regarding repairs and remedial measures. However, it has been felt that in order to ensure immediate action during the actual onslaught of floods and reduce their adverse effects, it is necessary to highlight the emergent actions required to be taken by the field officers in charge of the sections. With the above in mind, this Ministry has prepared a list of such activities which is enclosed herewith. The list is by no means exhaustive and depending on the special situations obtaining in each region, the State authorities may add a few more of the essential items of action in the list as needed. It is, however, necessary that wide circulation is given to this list among the field engineers who should ensure to keep it handy with all concerned officials upto the lowest technical level. It is also necessary to exercise a check, well in advance of every monsoon season, by the supervising officers regarding the actual state of preparedness to face any emergent situation.

3. The receipt of this letter may kindly be acknowledged.

Enclosure to Ministry's Circular No.NH/20017/7/90-PL dated the 18-6-92.

List of emergent actions to be taken in the event of disruption of traffic on account of damages due to floods in roads, bridges and bridge approaches:

The following is a list of emergent actions to be taken by the officer-in-charge of a road section when the same is seriously affected by floods leading to partial or total disruption of traffic.

1. Intimation about flood damage:

- 1.1 In the event of disruption of traffic due to extensive damages or a breach in a NH or washing away of a bridge or its approaches, the first immediate step is to send a message to all higher officers including the district authorities through telegram/telex and also to the Director General (Road Development), Ministry of Surface Transport, New Delhi informing about the same.
- 1.2 In addition, in the case of traffic dislocation anticipated for a period of 24 hours or more, the EE/AE in-charge of the section shall ensure that the concerned officer in the Ministry of Surface Transport is also informed of the situation on telephone. If the telephone services are dislocated, the field officers may obtain the help of district authorities to use wireless facility for establishing contact with the State CE's, who in turn shall immediately inform the Ministry over telephone.
- 1.3 In some cases, particularly of major dislocations on important NHs, when all other possible communication channel have failed, the services of a special messenger may be utilised to somehow reach the State HQs who in turn may inform the Ministry about the position.
- 1.4 This shall be followed by a summary report indicating the particulars of the damage and causes of the same, the period over which the affected reaches are likely to be closed to traffic, the restoration measures already undertaken and further proposed to be taken the alternative arrangement made for diversion of traffic as also the approximate amount of likely liability. A copy of this report shall also be sent to the concerned Audit Officer.
- 1.5 Thereafter the Ministry shall be given messages at regular intervals indicating the latest situation of floods and progress of restoration till flood waters reced and normal traffic is restored.
- 1.6 Similar information is required to be furnished in case where NH stretch gets marginally overtopped by flood water although the situation is considered to be safe for traffic to ply without danger.

2. Measures to be adopted in case of a breach in road section due to floods.

- 2.1 Sections of National Highways which are vulnerable to flood attacks with possibility of breaches shall be identified before hand and the road section shall be kept under special watch during the monsoon to prevent such breaches.
- 2.2 For this purpose, advance collection of sand bags, boulders empty bitumen drums, hume pipes, salballah piles, etc shall be made at suitable sites so that these could be easily transported to the point of breach and used quickly.
- 2.3 The general preparedness for floods shall also cover a critical inspection of all longitudinal and cross drainage works prior to the onset of monsoon to see the general condition of maintenance and repair of protection works and to prevent choking and clogging of drains during floods. Roadside ditches and borrowpits shall be continuously connected for quick drainage of water to suitable outfalls. High embankment-pitching, toewalls etc., shall also be inspected for requirement of repairs.

- 2.4 For promptly carrying out emergent repairs to pothole depression etc., during or after the floods adequate collection of aggregates and bitumen emulsion shall be kept stored near vulnerable sections.
- 2.5 The officer-in-charge of a flood-prone section of NH shall also keep close liaison with State flood control authorities and inform them about the vulnerable section in canal or tank bundhs so that they can take advance preventive action to avoid breaches in the same which may otherwise lead to flooding of the NH.
- 2.6 Diversion roads required in the event of breaches shall be identified in advance so that traffic may be diverted at short notice, if necessary. Suitable direction boards shall be kept ready for this purpose. When such diversion route is in a State road, appropriate coordination shall be kept with the State authorities so that this road remains in a condition fit for carrying NH traffic temporarily in time of emergency.
- 2.7 To avoid heading up of traffic at the breach point, suitable advance warning signs shall be displayed well ahead of such locations so that the traffic may not proceed further and may stop and divert en-route.
- 2.8 In addition to signboards put on roads, whenever a road is closed to traffic, wide publicity shall be given to the news through the common news media and also through TV and radio depending upon the importance of the road section and the gravity and duration of the flood.
- 2.9 During the actual onslaught of floods a constant vigil shall be maintained all along the vulnerable sections of the road to keep a close watch on the trend of rise in water level, on signs of weakness in embankment and mark out locations where flood water rise fast to danger level. Section showing inadequacy of clearance in height of structure and embankment and CD structures showing inadequacy of discharge capacity may be noted for preparation of permanent remedial measures proposal afterwards.
- 2.10 Restoration work for the breaches shall commence immediately after the floods subside. This shall be carried out with the highest priority and the procedure for award of such emergency work should be streamlined in advance.
- 2.11 On completion of restoration work, traffic shall be allowed again when the flood waters have receded sufficient and no danger is expected to traffic from floods.
- 2.12 After reopening to traffic the Ministry shall again be informed telegraphically and the information about re-opening of traffic given to public through newspapers.

3. Special measures to be adopted in the event of disruption of traffic due to damage to bridges or bridge approaches:

In addition to the instruction contained in Para 1 & regarding sending information about flood damages, preparedness to plug breaches etc. in vulnerable sections and measures for diversion of traffic, the following additional points may also be kept in view with regard to damages to bridges and their approaches.

3.1 In order to avoid washing away of bridges/approach attention to the following points is necessary:

- i) To take soundings before, during and after each flood at all foundation locations for all bridges built across major rivers with alluvial beds particularly where the rivers show a tendency to meander and give rise to concentrated flows and to maintain a permanent record of the same.
 - ii) to observe high flood level, discharge, velocity of flow, obliquity of flow, erosion of banks, functioning of the bridge waterway and changes in flow pattern.
 - iii) In cases where such records reveal that scour as observed has a tendency to exceed the earlier anticipated design scour depth, appropriate steps like dumping of boulders around the foundation locations or extending to full fledged garlanding of foundations laid at suitable levels which will not cause adverse or deteriorating flow condition of the river around piers may be resorted to after obtaining the approval of competent authority.
 - iv) In some cases it may be found necessary to train the river and guide the flow more uniformly through the various opening by means of proper training works such as guide bund spurs etc.
 - v) Suitable concrete blocks/wooden packing may be provided under the beams near the bearing to ensure that in the event of the superstructure being dislodged from bearings it would ultimately rest on such concrete/wooden blocks avoiding the risk of total collapse.
- 3.2 Advance collection of sand bags, boulders and G.I. wire (for making of crates) at suitable sites may be made so that the same could be easily used for protective works in case of emergency.
 - 3.3 as permanent restoration measure may take some time, temporary restoration measures may be carried out immediately to keep the communications through by provision of Baily bridges, SPT Bridge or diversion roads etc.
 - 3.4 In case of necessity of a Baily bridge, effort should be made to arrange the same from the State itself, if available, otherwise local Army Authorities may be contacted.
 - 3.5 Permanent restoration measure, may be taken up immediately after the completion of temporary restoration work, Procedure for execution of such work should be streamlined.
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