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No.RW/NH-33022/2/90-DO II

Dated the 20th August, 1990

To

The Chief Engineers (dealing with National Highways), Public Works Departments of all States and Union Territories; Director General (Works) Central Public Works Department; Director General Border Road.

Subject: Provision for Road Safety in estimates for National Highway Projects.

India has one of the highest accident rates in the world and the number of road accidents is steadily rising. In 1988 around 50,000 lives were lost and 200,000 persons injured in road accidents. In financial terms, road accidents entail an annual loss of around Rs. 1,000 crores.

2. While road accidents can have many causes, it is accepted that the accidents can be reduced through careful attention to road design and other engineering measures. While doing so, emphasis should be on adoption of simple low cost improvements, and inculcation of a "safety-conscious design process". The overall approach should be to build "forgiving" highways through features such as wide shoulders, guard rails, and flat side slopes, so that an out of control vehicle leaving the road will possibly be less damaged.

3. Important safety measures which could be considered are:

Improvement of specific intersections which account for roughly one third of all accidents.

- (ii) Comprehensive improvement of accident-prone sections especially in terms of geometrics, surface condition, provision of signs and markings etc.
- (iii) Use of retro-reflective road signs, and thermoplastic road markings with beads for better night visibility.
- (iv) Proper attention to hill/ghat sections in terms of signs, markings, no overtaking zones, speed limit signs, guard rails, and provision of truck climbing lanes on sections with steep grades.
- (v) Provision of transition guard rails and flat side slopes on approaches to bridges and high embankments etc.
- (vi) Upgrading of unmanned railway level crossings to manned ones, or provision of automatic audio visual signals, signs and : rumble strips as an alternative.
- (vii) Removal/prohibition of speed breakers on National and State Highways.
- (viii) Installation of flood level indicators at submersible bridges; and
- (ix) Provision of adequate arrangements for guidance, regulation, and safety of traffic flow alongwith warning signs/markings etc. at construction sites.

4. It has been observed generally that many a times due consideration is not given to road safety aspects while preparing project proposals for improvement of road and bridge projects. In order to provide proper guidance on the requirements of road safety and improvement in traffic flow, a check list of points to be considered while preparing proposals for National Highway projects has been prepared and is enclosed as Annexure - I.

5. The above check-list should be kept in view while formulating proposals for National Highways works in future and suitable provisions for road safety features made in the estimates. In compliance with this, a copy of the check list along with remarks against each item, should be appended to all estimates for road improvements submitted to this Ministry. These instructions may please be circulated to all the concerned officers for guidance and compliance.

Annexure I

Enclosure to Circular No. RW/NH - 33022/2/90 - DO II dt 20.8.90

Check List of road safety features to be considered in preparation of road projects.

1. *Horizontal Profile*

Whether this section of road has following deficiencies (with respect to Geometric Design Standards given in IRC: 73 - 1980) and if so, whether provision for their improvement has been made:

- (a) Sub-standard horizontal curves.
- (b) Inadequate sight distance for the design speed especially at horizontal curves and intersections.
- (c) Inadequate super-elevation on horizontal curves.
- (d) Lack of extra, pavement widening on curves

2. *Vertical Profile:* Whether the following aspects have been taken care of (as per IRC: 73 - 1980)

- (a) Improvement of any sharp longitudinal gradients.
- (b) Provision of properly designed vertical curves at all grade changes.
- (c) Coordination of the vertical alignment with the horizontal alignment.

3. *Cross Sectional Elements*

(a) Whether the following components are adequate:-

- (i) Existing/proposed road width for design for traffic volume corss-slope / condition of pavement and shoulder (as per IRC: 73 - 1980)
- (ii) Embankment/out slopes as per IRC: 36 - 1970.

(b) Whether the full cross section of road has been taken across culverts and minor bridges upto 30m span.

4. *Road Intersections*

- (i) Whether the intersections have been designed/improved for expected traffic at the and of design period.
- (ii) Whether islands/channelisers in the intersection area in rural sections are provided with mountable type kerbs and suitably painted.
- (iii) Whether medians/islands/approcahes to intersections are provided with properly laid out guidance systems in the forms of signs and pavement markings as per IRC: 35-1970

5. *Traffic Control Devices*

- (a) Whether traffic control devices such as signs, signals, road markings have been provided in accordance with relevant IRC Standards (IRC: 67-1977, IRC: 93-1985 and IRC: 35-1970) including need for retroreflective signing and then thermo plastic pavement markings for high-traffic density corridors.
- (b) Whether delineators as per IRC: 79-1981 provided, wherever required, to guide the traffic.

6. *Safety Features*(a) *Railing barriers in hazardous locations*

Whether railing/crash barriers, adequate shoulders and side slopes have been provided for safety at hazardous locations, approaches to narrow bridges, high embankments etc.

(b) *Road-Rail at grade crossing*

Whether there are any unmanned/manned road-rail crossings and whether suitable warning signs/signals, imposition of speed limits, and rumble-strips on both sides have been provided as per Ministry's circulars.

(c) *Flood level indicators*

Whether these are provided at the submersible bridges and causeways.

(d) *Pedestrian facilities*

Whether the following (as per IRC: 103-1988) are needed and provided for:

(a) Footpaths of adequate width with suitable surfacing at busy intersections in urban/semi urban areas.

(b) Railing barriers with pedestrian crossing at inter-sections to control the movement of pedestrians.

(e) *Speed Breakers*

Whether there are any existing speed breakers. If so, whether provision made for their removal.

7. *Ancillary Items*(a) *Shoulders*

Whether paved shoulders have been proposed in high traffic density corridors and other vulnerable locations such as approaches to bridges, urban areas etc.

(b) *Laybys and Busbays*

Whether the need for the following components has been examined and suitable provisions made.

(i) Parking laybys as per Ministry's type drawings in Sections having heavy truck parking demand.

(ii) Appropriate layouts for check barriers as per IRC: 41-1972 and collection plazas as per Ministry's type designs and

(iii) Pick up bus stops as per IRC: 80-1981 for rural highways and IRC: 70-1977 for urban areas.

(c) *Access Points and Median Gaps*

Whether any access points of median gaps are less than 750 m apart. If so, whether provisions, like service road to control access, need inclusion.

(d) *Service Roads*

Whether provision of service road considered in built-up areas for access control.

(e) *Safety in construction Zones*

a) Whether plans made for diversion/controlling of traffic during execution of work; and

b) Whether provision made for barricading diversions, alongwith signs, markings, reflectors, night lighting etc. for traffic control/guidance during construction phase as per section 112 of Ministry's specification for Road and Bridge Works and other circulars and directives.

(f) *Hill/Ghat Sections*

Whether Safety needs especially in terms of signing/markings, delineation, no overtaking/speed limit zones, guard rails, climbing lanes, passing areas etc. considered.

(g) *Location of trees/vegetation*

Whether removal of trees other vegetation, which may prove hazardous due to their proximity to travel path, blocking the sight line or encroaching on the requisite vertical clearance is included in the proposal.