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12.10.18
(विप्रेत शाह)
अधिशारी अभिलेखा

No. NH-15017/ 28/ 2018 - P&M

Government of India

Ministry of Road Transport & Highways
(Planning Zone)

Transport Bhawan, 1, Parliament Street, New Delhi - 110001

(17)
12/10/18

Dated, the 23rd March 2018

Subject: Standards for Lane width of National Highways and roads developed under Central Sector Schemes in Hilly and Mountainous terrains - Reg.

Sir,

On the subject of "Capacity building and lane width of National Highways", it has been stipulated vide this Ministry's letter No. NH-14019/6/2012-P&M dated 05.10.2012 that width of carriageway shall be at least two lane with paved shoulders irrespective of the traffic thereon in new projects undertaken for widening of carriageway/ bypasses/ realignments.

2. However, challenges have come to the fore in adhering to these standards in the context of National Highways and roads in hilly and mountainous terrains. These challenges arise on account of destabilization of hill slopes and progressive damaging effects on road alignments and structures in higher contours on hills due to excavation works, requirement for large-scale felling of precious trees, associated environmental damages. Resultantly, there arises need to provide largescale protection works, acquisition of additional land for Right of Way (ROW), etc.

3. It is pertinent to mention in this context that the Ministry has been laying emphasis on improvement of road connectivity for the hilly and mountainous regions, backward and tribal areas, and tourist destinations. Design traffic volumes in most of the roads connecting such destinations are invariably less than about 5,000 PCUs/ day or so. Considering the requirement to enhance road network in the hilly and mountainous regions in a time bound manner, development of connectivity to various destinations in such regions without compromising required road safety standards has to be accorded priority over development of facilities enabling high speed mobility of traffic.

4. The provisions of Ministry's letter No. NH-14019/6/2012-P&M dated 05.10.2012, have, accordingly, been reviewed and it has been decided with the approval of the Competent Authority that the following provisions shall be applicable henceforth for National Highways and roads under Central Sector Schemes in hilly and mountainous terrains until further orders:

4.1 The design speed of the roads shall be as per the extant policies (viz. as per IRC: 73 - 1980 (Geometric Design Standards for rural (Non-Urban) Highways). Although, the geometric design standards need to comply with the broad requirements stipulated as per these standards, difficulties may arise in certain site-specific situations to ensure their strict adherence. Necessary speed restriction signs shall be erected at appropriate locations in such situations e.g. for stretches having inadequate available sight distances or at deficient curves/ hair-pin bends, etc. as per site specific requirements.

- 4.2 Adequate provisions for road signage and markings etc. shall be made in the road sections as per the extant policies viz. IRC: 67- 2012 (Code of Practice for Road signs), IRC: 35 - 2015 (Code of Practice for Road markings). Provisions for crash barriers shall also be made as per extant policies, especially at vulnerable locations.
- 4.3 The additional land for the required ROW should preferably be acquired on one side rather than on both sides of the existing road unless dictated by road-geometrics requirements.
- 4.4 Following specific provisions shall be made for traffic volumes ranging from 3,000 PCUs/ day to about 8,000/ day: -
- (i) The carriageway width shall be of intermediate lane configurations, i.e. of 5.5 m width (18 ft), with two-lane structures (23 ft.).
 - (ii) The passing places may have widths of 2.5 m and 12 m length and these may be provided on alternate sides of the road. The length of the tapered section may be 6 m on either side of their approaches. Accordingly, the length of the passing places may be 24 m inclusive of the tapered length.
 - (iii) As far as possible, efforts shall be made to provide passing places at locations that could be inter-visible or upto a maximum distance of 500 m apart.
 - (iv) They should not be sited on the inside of a left hand curve of radius less than the appropriate value for the design speed of the road as this can lead to compromise with visibility.
 - (v) Further, the passing places/ temporary lay-bys should not be sited on the outside of a right hand curve with a radius of less than the appropriate value for the design speed of the road as this increases the risk as a fatigued driver may unintentionally enter the passing places/ temporary lay-by at high speed.
 - (vi) Also, drivers approaching a temporary lay-by along the road must be able to see vehicles entering or exiting the lay-by for a distance corresponding to the desirable Minimum Stopping Sight Distance for the design speed of the road. Informatory signs shall be erected at appropriate locations for such lay-bys and further necessary markings shall also be provided.
 - (vii) The Roadway width for Hilly and Mountainous Terrain as per IRC: SP⁷³2015 (Manual of Specifications and Standards for Two laning of Highways with paved shoulder) would stand amended accordingly.
- 4.5 For traffic volume of more than 10,000 PCUs/ day or the existing traffic volumes likely to witness a fast growth to reach this level within a period of 3 to 5 years, the carriageway width shall be of two lane NH configurations, i.e. of 7 m width. The carriageway widths shall be of two lane NH configurations with paved shoulders only in cases where the traffic is likely to increase at about more than 10 % per annum.
5. The provisions of Ministry's letter No. NH-14019/6/2012-P&M dated 05.10.2012 shall continue to be applicable in all other cases.
6. It is requested that the contents of this letter may be brought to the notice of all concerned for needful compliance.

Vipnesh

(Vipnesh Sharma)
Superintendent

कार्यालय परियोजना निदेशक/मुख्य अभियन्ता
पी०एम०यू० ए०डी०बी० लोक निर्माण विभाग, देहरादून

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पत्रांक- 1419/40 पी०एम०यू०, ए०डी०बी० (सड़क) उत्तराखण्ड/2018

दिनांक- 04/10/2018

सेवा में,

प्रमुख अभियन्ता एवं विभागाध्यक्ष,
लोक निर्माण विभाग,
देहरादून।

विषय:- USHIP के मार्गों हेतु Road Geometrics / Codal Guideline पर निर्णय के सम्बन्ध में।

संदर्भ:- इस कार्यालय का पत्रांक 1160/40पी०एम०यू०, ए०डी०बी० (सड़क) उत्तराखण्ड/2018 दिनांक 21.08.2018।


महोदय,

उपरोक्त विषयक अवगत कराना है कि ए०डी०बी० द्वारा प्रस्तावित नये Loan USHIP के अंतर्गत चयनित मार्गों की डी०पी०आर० बनाने की प्रक्रिया गतिमान है। Concept Note के अनुसार पर्वतीय क्षेत्रों में न्यूनतम मार्गों की चौड़ाई 1.5 लेन तथा मैदानी भागों में न्यूनतम दो लेन किया जाना प्राविधानित है।


पर्वतीय क्षेत्रों हेतु 1.5 लेन हेतु IRC के स्पष्ट प्राविधान नहीं है। पूर्व में भी उपरोक्त संदर्भित पत्र द्वारा IRC SP-48 एवं IRC SP-73 का Comparison प्रेषित किया गया था। पर्वतीय मार्गों हेतु IRC SP-48 एवं IRC SP-73 के अतिरिक्त IRC - 52 एवं IRC - 73 में भी कुछ प्राविधान है। अतः डी०पी०आर० गठन हेतु IRC - 52, IRC - 73, IRC SP-48 एवं IRC SP-73 के प्राविधानों का Comparison संलग्न कर सुलभ संदर्भ हेतु प्रेषित किया जा रहा है। **(IRC - 52, IRC - 73, IRC SP-48 एवं IRC SP-73 का Comparison संलग्न)**

अतः उपरोक्त के सम्बन्ध में सम्यक निर्णय लेने हेतु आपसे पुनः अनुरोध है कि अपने स्तर से समस्त सम्बंधित की बैठक कर उपरोक्त बिन्दुओं पर निर्णय करने की कृपा करें।

संलग्न- उपरोक्तानुसार।


(श० शरद कुमार बिरला)
परियोजना निदेशक/मुख्य अभियन्ता

प्रतिलिपि- मुख्य अभियन्ता, लो०नि०वि० टिहरी/पौड़ी/हल्द्वानी/अल्मोड़ा/पिथौरागढ़/देहरादून को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।


परियोजना निदेशक/मुख्य अभियन्ता

Geometric Design of Hill Roads

Following codes are Guiding Standard:

1. IRC : 52 – 2001 : 'Recommendation about the alignment survey and Geometric Design of Hill roads'
2. IRC: 73 – 1980 : 'Geometric Design Standards for Rural (Non-Urban) Highways'
3. IRC: SP: 48 – 1998 : 'Hill Road Manual'
4. IRC : SP : 73 – 2015 : 'Manual of Specification & Standards for two laning of Highway with Paved Shoulder'

Comparison of geometrical elements

Sl. No.	Item	IRC : 73		IRC: 52		IRC : SP : 48		IRC : SP : 73
		Mountainous Terrain	Steep Terrain	Mountainous Terrain	Steep Terrain	Mountainous Terrain	Steep Terrain	Mountains & Steep Terrain
1.	Carriageway	Two lane :7.0 m Intermediate lane: 5.50m	Two lane :7.0 m Intermediate lane: 5.50m	Two lane :7.0 m Intermediate lane: 5.50m	Two lane :7.0 m Intermediate lane: 5.50m	Two lane :7.0 m Intermediate lane: 5.50m	Two lane :7.0 m Intermediate lane: 5.50m	Two Lane with paved shoulders : 7.00m
2.	Shoulders	0.9m	0.9m	0.9 m	0.9 m	0.9 m	0.9 m	1.5 (Hill) + 1.5 (Valley) / 1.5 (Hill) + 2.5 (Valley)
3.	Design Speed	50 (Ruling) & 40 (minimum)	40 (Ruling) & 30 (Minimum)	50 (Ruling) & 40 (minimum)	40 (Ruling) & 30 (Minimum)	50 (Ruling) & 40 (minimum)	40 (Ruling) & 30 (Minimum)	60 (Ruling) & 40 (Minimum)
4.	Minimum Radii of Horizontal curve	80 (R) & 50 (M) (not affected by snow) 90 (R) & 60 (M) (affected by snow)	50 (R) & 30 (M) (not affected by snow) 60 (R) & 33 (M) (Snow bound areas)	80 (R) & 50 (M) (not affected by snow) 90 (R) & 60 (M) (affected by snow)	50 (R) & 30 (M) (not affected by snow) 60 (R) & 33 (M) (Snow bound areas)	80 (R) & 50 (M) (not affected by snow) 90 (R) & 60 (M) (affected by snow)	50 (R) & 30 (M) (not affected by snow) 60 (R) & 33 (M) (Snow bound areas)	150 (R) & 75 (M)
5.	Design service volume in PCUs per day	Intermediate Lane: 5000 PCU/day (earthen shoulder) Two Lane: 10000	Intermediate Lane: 5000 PCU/day (earthen shoulder) Two Lane: 10000 PCU/day(earthen	Intermediate lane low curvature = 5200 High Curvature = 4500 Two Lane	Intermediate lane low curvature = 5200 High Curvature = 4500 Two Lane	Intermediate lane low curvature = 5200 High Curvature =	Intermediate lane low curvature = 5200 High Curvature = 4500	Two Lane with paved shoulders 9000

		PCU/day(earthen shoulder)	shoulder)	low curvature = 7000 High Curvature = 5000	low curvature = 7000 High Curvature = 5000	4500 Two Lane low curvature = 7000 High Curvature = 5000	Two Lane low curvature = 7000 High Curvature = 5000	
6.	Gradient	Ruling = 5% Limiting = 6% Exceptional = 7%	Ruling = 6% Limiting = 7% Exceptional = 8%	Ruling = 5% Limiting = 6% Exceptional = 7%	Ruling = 6% Limiting = 7% Exceptional = 8%	Ruling = 5% Limiting = 6% Exceptional = 7%	Ruling = 6% Limiting = 7% Exceptional = 8%	Ruling = 6% Limiting = 7%
7.	Extra widening	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	Curve up to 40m = 1.5m 41 to 60m = 1.2m 61 to 100m = 0.9m 101 to 300 m = 0.6m Above 300m = Nil	75m to 100m = 0.9m 101 to 300m = 0.6m Above 300m = Nil
8.	Site Distance	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 30 Km/hr Stopping: 30m Intermediate:60m Speed 40 Km/hr Stopping: 45m Intermediate:90m Speed 50 Km/hr Stopping: 60m Intermediate:120m 	<ul style="list-style-type: none"> Speed 40 Km/hr Stopping: 45m Intermediate:90m Overtaking:165m Speed 60 Km/hr Stopping: 90m Intermediate:180m Overtaking:340m

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dominate stretch and accordingly standards adopted for that stretch. The same standards should, generally, continue for maximum distance possible practicable.

7. WIDTHS OF ROAD LAND, ROADWAY, CARRIAGEWAY AND SHOULDERS

7.1. Desirable widths of road land (also termed as right of way) for various categories of roads is given in Table 1.

Table 1. Desirable Road Land Widths (m)

Sr. No.	Road classification	Open areas		Built up areas	
		Normal	Exceptional	Normal	Exceptional
1.	National and State Highways	24	18	20	18
2.	Major District Roads	18	15	15	12
3.	Other District Roads	15	12	12	9
4.	Village Roads	9	9	9	9

Notes:

- (1) In order to ensure proper sight distance, it may be necessary to acquire additional right-of-way over that indicated in the Table. The right-of-way should be enough to ensure a minimum setback of 5 m for building line from the centreline of the road.
- (2) Additional land with reference to the requirements may be acquired at locations involving deep cuts, high fills and unstable or landslide prone areas.
- (3) If a road is expected to be upgraded to a higher classification in the foreseeable future, the land width should correspond to the higher class of road.

7.2. Widths of carriageway, shoulder and roadway for various categories of roads should be as given in Table 2.

Table 2. Width of Carriageway, Shoulder and Roadway

Highway Classification	Carriageway Width (m)	Shoulder Width (m)	Roadway Width (m)
(a) National Highways and State Highways:			
(i) Single-lane	3.75	2 x 1.25	6.25
(ii) Double-lane	7.00	2 x 0.9	8.8
(iii) Four-lanes or multi-lanes-width per lane 3.5 m	-	-	-
(b) Major Dist. Roads and Other Dist. Roads	3.75	2 x 0.5	4.75
(c) Village Roads	3.00	2 x 0.5	4.0

Notes:

- (1) The roadway widths given in the Table are exclusive of parapets (usual width 0.6 m) and side drains (usual width 0.6 m)
- (2) The roadway widths for village roads are on the basis of a single-lane carriageway of 3 m. Widths greater than 3 m may, however, be adopted judiciously depending on the type and intensity of traffic, cost and related factors. In that case, the roadway width should be increased correspondingly.
- (3) In hard rock stretches, where excess cutting might lead to slope failure, width of roadway may be reduced by 0.8 m on two-lane roads and 0.4 m in other cases. However, where such stretches occur in continuous long length, reduction in roadway width should not be effected unless requisite passing places as per Section 15 are provided.
- (4) On horizontal curves, the roadway width should be increased corresponding to the extra widening of carriageway for curvature, vide para 11.5.
- (5) On roads subject to heavy snowfall, where regular snow clearance is done over long periods; to keep the road open to traffic, roadway width may be increased by 1.5 m for MDRs, ODRs and VRs.
- (6) In unstable stretches which are prone to frequent landslides, the roadway width of single-lane roads may be increased by half the carriageway prescribed in Table 2 with the aim to keep the road open to traffic even after the occurrence of landslides.

7.3. The clear roadway width available on culverts, scuppers and causeway (measured from inside to inside of parapet walls or kerbs) should be as given below:

All roads other than Village Roads	As given in Table 2
Minimum desirable for Village Roads	4.25 m.

7.4. At bridges (greater than 6 m span), the clear width of roadway between kerbs should be as under:

Single-lane bridge	4.25 m
Two-lane bridge	7.5 m

7.5. In case of widening of the existing two-lane road to four-lanes, it may be desirable to plan a separate alignment for the additional two-lanes, in order to avoid the problems of stability of the existing hill slopes.

7.6. Capacity Considerations in Hill Roads

7.6.1. IRC:64-1990 'Guidelines for Capacity of Roads in Rural Areas' contains recommended design service volumes for hill roads also. These are given in Table 3.

7.6.2. The capacity of two-lane roads can be increased by providing paved and surfaced shoulders at least 1.5 m width on either side. Provision of hard paved shoulders results in slow moving traffic being able to travel on the shoulder which reduces the interference to fast traffic on the main carriageway. Under these circumstances, 15 per cent increase in capacity can be expected, vis-a-vis, the values given in Table 3.

Table 3. Recommended Design Service Volumes for Hill Roads

Sr. No.	Types of Road	Design Service Volume in PCU/day		
		Carriageway width	For low curvature (0-200 degrees per km)	For high curvature (above 200 degrees per km)
1.	Single-lane	3.75 m	1,600	1,400
2.	Intermediate-lane	5.5 m	5,200	4,500
3.	Two-lane	7.0 m	7,000	5,000