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पत्रांक:- 2507/ 13 मं.ग.  
सेवा में,

दिनांक 15/12/2020

प्रभागीय वनाधिकारी  
नरेन्द्रनगर वन प्रभाग,  
मुनीकीरेती।

विषय:- मा0 मुख्यमंत्री घोषणा के अन्तर्गत जनपद टिहरी के विधानसभा क्षेत्र टिहरी में चम्बा मसूरी मोटर मार्ग के काणाताल से अंधियार गढ़ी सनगांव तक मोटर मार्ग का नवनिर्माण कार्य। (घो. सं. 672/2012) (लम्बाई 4.775 किमी.) Proposal No- FP/UK/ROAD/32834/2018

सन्दर्भ:- पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय क्षेत्रीय कार्यालय (उत्तर-केन्द्रीय क्षेत्र) 25 सुभाष रोड देहरादून के फाईल संख्या- 8बी./यू.सी.पी./06/148/2019/एफ0सी0/1829 दिनांक 26.11.2020

महोदय,

उपरोक्त विषयक सन्दर्भित पत्र द्वारा वन भूमि प्रस्ताव में लगाई गई आपत्तियों का निम्नवत निराकरण कर एवं ऑन लाईन Additional information Details में संलग्न कर आपको आवश्यक कार्यवाही हेतु प्रेषित है :-

Sl. No	EDS	Clearification/Answer
1	इतने घने वन क्षेत्र में भी 7 मी0 चौड़ाई में मार्ग निर्माण का क्या औचित्य है?	IRC SP 48 के Clause No 3.4.18 के अनुसार सिंगल लेन के लिए Carriageway की चौड़ाई 3.75 मी0 ली गयी है, जिसमें दोनों तरफ पटरी (Shoulder) की चौड़ाई (0.50x2=1.00 mtr.) , Side Drain की चौड़ाई 0.60 मी0 तथा पैरापिट की चौड़ाई 0.60 मी0 जोड़ने पर सीधी जगह पर मार्ग की कटिंग की कुल चौड़ाई 5.95 मी0 आती है। IRC SP 48 के Clause No 6.8.5.2 के टेबल नं0 6.9 के अनुसार पहाड़ी मार्ग के लिए विभिन्न कर्वों में अधिकतम अतिरिक्त चौड़ाई 0.90 मी0 का प्राविधान है। चूंकि पहाड़ी मार्ग का अधिकांशतः पूरा भाग ही कर्व में डिजाइन किया जाता है इस अनुसार 5.95 मी0 चौड़ाई में अतिरिक्त चौड़ाई 0.90 मी0 जोड़ने पर मार्ग की कुल चौड़ाई (ROW) 6.85 मी0 आती है, जिसे लगभग 7.00 मीटर चौड़ाई में वन भूमि अधिग्रहित की गयी है। अतः वन भूमि वाले भाग में मार्ग की कटिंग की चौड़ाई (ROW) को अधिग्रहित किया गया है इसके अलावा अतिरिक्त भूमि नहीं ली गयी है। जिससे कम से कम वन क्षेत्र एवं वृक्ष प्रभावित हो रहे हैं। (संलग्न IRC SP 48 के Clause No 3.4.18, IRC SP 48 के Clause No 6.8.5.2)
2	पहाड़ी क्षेत्रों में मार्ग की चौड़ाई हेतु निर्धारित technical guidelines उपलब्ध कराएँ।	पहाड़ी मार्गों हेतु IRC SP 20 के Clause No 2.6.1 टेबल संख्या- 2.3 के अनुसार ग्रामीण मार्गों के लिये 12 मी0 एवं 9 मी0 Road land width का प्राविधान है। इसके Note (ii) के अनुसार जहां पर 100 वाहन प्रतिदिन से कम की संख्या हो तथा मार्ग किसी Dead End में समाप्त हो रहा हो तथा Low Habitation हो वहां पर कम चौड़ाई में Road land width का प्राविधान किया जा सकता है। इन्हीं प्राविधानों के अनुरूप वन भूमि क्षेत्र में 7.00 मीटर एवं अन्य स्थानों पर 9.00 मीटर चौड़ाई में भूमि अधिग्रहण का प्राविधान रखा गया है। (संलग्न IRC SP 20 के Clause No 2.6.1)

अतः अनुरोध है कि अपने स्तर से वन भूमि हस्तान्तरण प्रस्ताव स्वीकृत कराने की आवश्यक कार्यवाही करने की कृपा करें।

संलग्न - उपरोक्तानुसार तीन प्रपत्र

(एन0एस0 खोलिया)  
अधिशासी अभियन्ता

पत्रांक /13 एम0जी0 तददिनांक

प्रतिलिपि:- अपर प्रमुख वन संरक्षक एवं नोडल अधिकारी, वन संरक्षण, इन्दिरानगर फारेस्ट कालोनी, उत्तराखण्ड देहरादून को सूचनार्थ प्रेषित।

प्रतिलिपि:- श्री महावीर सिंह नेगी, वन भूमि सहायक, निर्माण खण्ड, लो.नि.वि. चम्बा को सूचनार्थ प्रेषित।

अधिशासी अभियन्ता



3.4. **Geometrics**

- 3.4.1. **Camber:** is the convexity given to the cross section of the surface of the carriageway to facilitate drainage.
- 3.4.2. **Crossfall:** is the fall at right angles to an alignment given to the surface of any part of a roadway. It may be expressed as ratio of vertical to horizontal or equivalent percentage.
- 3.4.3. **Curvature (degree of):** is the angle in degrees subtended at the centre of a circular arc by a chord of a given length, usually 30 meters.
- 3.4.4. **Curve horizontal:** is the curve in plan to change the direction of the centre line of a road.
- 3.4.5. **Curve transitional:** is a curve whose curvature goes on changing at a certain rate from one radius to another radius for giving smooth change of direction of road.
- 3.4.6. **Curve vertical:** is a curve in the longitudinal section of a roadway to provide for easy and safe change of gradient.
- 3.4.7. **Curve compound:** is a curve consisting of two or more arcs of different radii curving in the same direction and having a common tangent at the point or points of junction.
- 3.4.8. **Curve reverse:** is a curve consisting of two arcs of the same or different radii curving in opposite directions and having a common tangent at the point of junction.
- 3.4.9. **Gradient (incline or grade) :** is the rate of rise or fall with respect to the horizontal along the length of a road expressed as a percentage or as a ratio or in degrees.
- 3.4.10. **Gradient ruling:** is a gradient which in the normal course must never be exceeded in any part of a road.
- 3.4.11. **Gradient limiting:** is a gradient steeper than the ruling gradient which may be used in restricted lengths where keeping within the ruling gradient is not feasible.
- 3.4.12. **Gradient exceptional:** is a gradient steeper than the limiting gradient which may be used in short stretches only in extra-ordinary situations.
- 3.4.13. **Hairpin bend:** is a bend in alignment resulting in reversal of direction of flow of traffic. A bend may be for reversing road direction on same face of hill slope.
- 3.4.14. **Lateral clearance:** is the distance between the extreme edge of the carriageway to the face of the nearest structure/obstruction.
- 3.4.15. **Ruling minimum radius of a curve:** is the minimum radius of curvature of the centreline of a curve necessary to negotiate a curve at ruling minimum design speed.
- 3.4.16. **Absolute minimum radius of a curve:** is the minimum radius of the centreline of a curve necessary to negotiate a curve at absolute minimum design speed.
- 3.4.17. **Roadway width:** is the sum total of carriageway width and shoulder width on either side. It is exclusive of parapets and side drains.
- 3.4.18. **Road lane width:** refers to the width of carriageway of the road in terms of traffic lanes. Single lane 3.75 m, intermediate lane 5.5 m and double lane 7.0 m (7.5 m with raised kerbs), multilane 3.5 m per additional lane.



**6.8.5. Widening at curves**

6.8.5.1. At sharp horizontal curves, it is necessary to widen the carriageway to facilitate safe passage of vehicles. The widening has two components i.e. Mechanical widening to compensate the extra width occupied by the vehicle due to tracking of rear wheels and Psychological widening to permit easy crossing of vehicles, since vehicles tend to wander more on curve. Both the components are to be taken care of in double lane and mechanical components on single lane roads. However, at blind curves double-laning may be considered.

6.8.5.2. Extra width to be provided on horizontal curves is given in Table 6.9.

**Table 6.9. Widening of Pavement at Curves**

Radius of Curve (m)	Upto 20	21 to 40	41 to 60	61 to 100	101 to 300	Above 300
Extra Width (m)						
Two-lane	1.5	1.5	1.2	0.9	0.6	Nil
Single-lane	0.9	0.6	0.6	Nil	Nil	Nil

6.8.5.3. Extra width should be given by increasing the width at uniform rate along transition curve and full width given along circular curve. Entire widening should preferably be provided on inside of the curve. The extra widening may be attained by means of offsets radial to the centre line. It should be ensured that the pavement edge lines are smooth and there is no apparent kink.

**6.8.6. Set-back distance at horizontal curves**

6.8.6.1. Requisite sight distance should be available to sight the inside of horizontal curves. Lack of visibility in the lateral direction may arise due to obstructions like walls, cut slopes, wooded areas, high crops, etc. Set-back distance from the centre line of the carriageway, within which offending obstructions should be cleared, to ensure the needed visibility, can be determined as given in para 6.8.6.2. However, in certain cases, due to variations in alignment, road cross-section and the type and location of obstructions, it may become necessary to resort to field measurements to fix the exact limits of clearance.

6.8.6.2. The set-back distance is calculated from the following equation (see Fig. 6.11 for definitions):

$$m = \frac{R(R-n)}{S} \cos \theta$$

where  $\theta = \frac{S}{2(R-n)}$  radians;

$m$  = the minimum set-back distance to sight obstruction in metres (measured from the centre line of the road);

$R$  = radius at centre line of the road in metres;

$n$  = distance between the centre line of the road and the centre line of the inside lane in metres; and

$S$  = sight distance in metres

In the above equation, sight distance is measured along the middle or inner lane. On single-lane roads, sight distance is measured along centre line of the road and 'n' is taken as zero.



## 2.4. Design Speed

Design speed is a basic criterion for determining all geometric features of horizontal and vertical alignments. The design speeds for the rural roads should be taken as given in Table 2.2.

TABLE 2.2. DESIGN SPEED

Road Classification	Design Speed (km/h)							
	Plain Terrain		Rolling Terrain		Mountainous Terrain		Steep Terrain	
	Ruling	Min.	Ruling	Min.	Ruling	Min.	Ruling	Min.
Rural Roads (ODR and VR)	50	40	40	35	25	20	25	20

Normally ruling design speed should be the guiding criterion for the purpose of geometric design. Minimum design speed may, however, be adopted where site condition and cost does not permit a design based on "Ruling Design Speed".

## 2.5. Basic Principles of Geometric Design

These guidelines are intended for uniform practices to achieve optimum design standards for rural roads. As a general rule, geometric features of a road do not allow for stage construction. Improvement of features, like grade, curvature and widening of cross drainage works at a later date can be very expensive and sometimes impossible in remote and hilly area. It is, therefore, necessary that ultimate geometric requirement of rural road should be kept in mind right in the beginning.

If stage construction is unavoidable, the permanent works, like, retaining walls, breast wall, and drain, which may have to be altogether rebuilt, may be constructed using dry masonry. Interceptor drains may be located well at the beginning and culverts provided to full width to avoid the need for their widening subsequently.

The design standards recommended are absolute minimum. However, the minimum values should be applied only where serious restrictions are implied from technical or economical considerations. General effort should be to exceed the minimum values as far as possible. Road should be designed so as to have minimum turns and the total number of curves in one kilometer should generally be less than 6.

## 2.6. Cross-Sectional Elements

**2.6.1. Road Land Width :** Road land width (also termed the right-of-way) is the width of land acquired for road purposes. The desirable land width for rural roads in different terrain is given in Table 2.3.

TABLE 2.3. RECOMMENDED ROAD LAND WIDTH

Road Classification	Plain and Rolling Terrain				Mountainous and Steep Terrain			
	Open Area		Built-up Area		Open Area		Built-up Area	
	Normal	Range	Normal	Range	Normal	Exceptional	Normal	Exceptional
Rural Roads (ODR and VR), (m)	15	15-25	15	15-20	12	12	12	9

Note: (i) Additional land width as per requirement may be acquired at locations involving deep cuts, high banks and unstable or landslide prone areas.

(ii) The lower values of land width may be adopted where the traffic intensity is less than 100 vehicles per day, and where the traffic is not likely to increase due to situation, like, dead end, low habitation and difficult terrain conditions.