No. 4/1 /PWD /WD XIV(NH)/ 21-22/ ASW/ 219
Office of the Executive Engineer,
Works Division XIV(NH),
Public Works Department,
Fatorda, Margao - Goa

Date: 3 /01/ 2022

To
The Dy. Conservator of Forests,
Monitoring and Evaluation,
Goa Van Bhavan, Altinho - Goa

Sub: Diversion of 29.836 Ha. Of forest land for four laning of existing NH-17 from Km. 475.040 to Km. 611.000 in the state of Goa on BOT(Toll) basis under NHDP-III (Patradevi to Pollem section on NH-17) in favour Executive Engineer WD VII (NH), Public Works Department, Panaji – Goa – Reg.

Ref: 1. Letter No. F.No. 4-GOC1237/2020-BAN/1026 dated. 01.01.2021 from Regional Office, Bangalore, MoEF&CC

Dear Sir,

Please refer letter cited under reference , wherein the User Agency was asked to examine the feasibility of revision of proposals in the forest areas and submit a revised proposal as per the recommendations of Regional Empowered Committee (REC), Bangalore. The pointwise compliance of the same is submitted as under : 0

1. **As the User Agency is taking up four laning of the highway, whereas the forest land to be acquired for diversion is for 6 laning. As the forest area falls in dense evergreen and semi – evergreen forests of Western Ghats, the minimum requirement of forest land needs to be worked out and proposed for the minimum width by doing necessary resurvey/reassessment.**

   The existing road have been developed with greater focus on connecting the en-route towns and places, which often seen to be compromising in geometry and leading to longer distance between the major origin and destination points. Majority of the roads are serpentine alignments. The stretch from Existing Km. 570.000 to Km. 585.865 passes through hilly and rolling terrain. It has poor geometry with deficient visibility. Congestion, bottlenecks are frequently seen on existing road with long queues of vehicular movement, resulting in hazardous and unsafe condition to human as well as wildlife.

   It is to inform you that, 45m ROW has been proposed considering the hilly terrain where it involves cutting of the hill and filling in the valley based on topography. It is seen that the soil which is prevalent in the ghat section is mostly of laterite/morrum (Soft disintegrated rock) strata. Considering the heavy rainfall in Western Ghats, the soil is highly prone to slope failures/landslides. It is evident that, during the construction of the few stretches of Goa such as NH-4A (Kandepar realignment) and NH-17B (Missing link) many problems were arose due to slope failures/landslides. Keeping in view of these issues and futuristic development, to stabilize the slopes and the embankment of the proposed highway, 45m ROW was proposed.

As mentioned in the minutes, the forest land proposed for diversion is not for six lane it is for four lane configuration only. As per the clause 2.3 of IRC SP 84:2019, a minimum Right of Way(ROW) of 60m should be available for development of a 4-lane highway. But considering the forest and sensitivity of the area 45m ROW which is bare minimum required has been proposed.

2. **The width of the median may be restricted to the minimum, based on safety standards Reduction of median width**

The main purpose of the central median is to restrict the light glare of vehicles in opposite direction during traveling at night. The median width can be restricted from present 5m(including 0.50m kerb shyness on both sides) to 2.5m (including the kerb shyness 0.50m on both sides) for mountainous / steep terrains as per the clause 2.5.1 of IRC SP 84:2019. After reduction of the median the area for diversion is worked out to **28.18 Ha.** Hence, reduction in forest area by 1.656 Ha.

3. A detailed technical report as to why construction of tunnel or other alternatives are not feasible shall be provided

The alignment in Karmal Ghat stretch has sub standard horizontal & vertical curves in from Km. 579.000 to Km. 582.000.

In this regard, the two alternatives are proposed from the following considerations in the Karmal Ghat area.

- Improvement of existing 2 lane to 4 lane configuration with geometric improvement of curves.
- Realignment with tunnel and improving the geometry.

Comparison of alternatives for the section from Km. 579.000 to Km. 582.000 has been presented here under

Description	**Alternative – I** **Existing alignment**	**Alternative – II** **Realignment with tunnel**
Existing Right of Way	8 to 10m	There is no Existing right of Way available as it is a Greenfield alignment
Right of Way proposed	45m (the PROW 45m includes the existing Right of Way which is 8 – 10m)	For a twin tube tunnel of each 3 lane configuration, Right of Way of approximately 60 to 70m is required. In between the two tunnels, Minimum 20m to 40m is required considering the stresses generated and their effect on stability.

additional forest land to be acquired	14.04 Ha	17.25 Ha.
Construction time	Less compared to other option	Tunnel construction requires more time in construction when compared to existing road improvement.
Construction cost	25 Cr/Km	Approximately 250 – 300 Cr/Km for a twin tube tunnel (10 to 12 times higher than the existing road widening)
Safe passage for animals	At present there are no safe passages for wildlife. Proposed alignment involves safe passage for animals in the form of viaducts, Overpass, Underpass and Minor Bridges/Culverts.	Tunnel doesn't require any Safe passage as it doesn't obstruct any wildlife movement.
Geo technical parameters	Existing road widening involves cutting and filling. Slopes will stabilized using breast wall, retaining wall and soil nails if requires. 3 nos of viaducts are proposed on the valley side to avoid the slope failures considering the soft disintegrated rock.	As the soil strata of the mountain is of soft disintegrated rock, construction of tunnel becomes difficult. It may require most advanced technology to retain the overburden pressure.
Safety issues	The existing road widening will be an open construction. The safety issues such as landslides can be addressed easily.	Construction of a tunnel is a closed in nature. If any problem arises evacuation will be a problem. Tunnel will be closed for traffic movement in order to repair/rehabilitate the structures.
Geometry	Sub standard curves will be improved	-
Design speed	40 to 60 Kmph	80 Kmph

Considering safety issues, geotechnical parameters and cost, the tunnel construction is not a feasible option. Hence, the Widening of existing 2 lane to 4 lane configurations is opted. Ministry of Road Transport and Highways approved the same vide No.RW/NH-37015/03/2017/NHDP-IVA. Dt: 25.04.2017(copy enclosed).

It can be observed that if the tunnel is proposed as an alternative alignment in the Karmal Ghat in section between Km. 579.000 to Km. 582.000 requires a length of 1.5 Km approximately. It will have approaches of 750mts. on either sides. This would mean, that the number of trees in the alignment of tunnel would be more than that of existing alignment of highway, as number of trees

existing in the approach of tunnels is entirely Greenfield alignment. It would be more compared to lesser number of trees required to be cut in the alignment along the existing highway as existing road width (8-10m) is already available.

The state PWD has come to the conclusion that the soft disintegrated rock strata in this part of the state, is not suitable for construction of tunnel of huge magnitude. The Konkan Railway Corporation has already experienced failures of existing tunnels on several occasions. As tunnel construction also involves open approaches, it is certain that it will cause more damages to the ecology considering number of trees to be cut.

In view of aforesaid facts and figures, it is kindly requested to approve the forest diversion proposal along the existing NH-66 for a reworked out area of 28.18 Ha. against originally proposed area of 29.836 Ha. of forest land.

Yours faithfully

3.2.2022

Executive Engineer XIV(NH),
Public Works Department,
Fatorda, Margao - Goa

Copy to:-

1. The Chief Engineer(NH, R&B), PWD, Altinho, Panaji – Goa
2. The Superintending Engineer, C.O. IX(NH), PWD, Altinho, Panaji – Goa
3. The Dy. Conservator of forests, South Goa division, Margao – Goa
4. The Executive Engineer WD VII(NH), PWD, Panaji - Goa
5. M/s Aarvee Associates Architects, Engineers and Consultants Pvt Ltd, Hyderabad.

GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(NHDP-IVA Cell)

Transport Bhawan,
1, Parliament Street,
New Delhi–110 001

No. RW/NH-37015/03/2017/NHDP-IVA Dated 25th April, 2017

To

Chief Engineer (NH, R&B),
Public Works Department, Altinho, Panaji, Goa.

Subject: Alignment approval for the four-laning of NH-17 from km 535.500 [Zuari bridge down approach) to km 611.000 (Pollem) in the state of Goa.

Sir,

Please refer to your letter no. GOA/PWD/CE(NH,R&B)/F.MORTH/2015-16/986 dated 30.03.2017 requesting for approval of alignment for the proposed four-laning of NH-17 from km 535.500 [Zuari bridge down approach) to km 611.000 (Pollem) in the state of Goa as detailed below:

S.No.	Stretch	Length	Proposed alignment
1	km 535.500 to km 543.000 [Zuari bridge down approach to start of Margao bypass]	7.50 km	Four-laning along the existing alignment with minor geometric improvements within the available RoW.
2	km 555.000 to km 585.780 [Margao bypass end point to Canacona bypass start point]	30.78 km	Four-laning along existing alignment with combined bypass to Cuncolim and Bali villages from km 562.200 to 568.000 along alternate Alignment – II and geometric improvement along the existing alignment in Kharmal Ghat from km 572.000 to km 582.000
3	km 603.000 to km 611.00 [Canacona bypass end point to Pollem]	8.00 km	Four-laning along the existing alignment with realignment for geometric improvement from km 606.100 to km 607.300
	Total	**46.28 km**	

Above alignment proposal submitted by the State PWD has been examined in the meeting taken by DG (RD) & SS on 13.04.2017 and the same is agreed to in-principle. It is, therefore, requested to finalize the project proposals and expedite the submission of same for appraisal and approval of the Competent Authority. While doing so, availability of at least 90% RoW and publication of 3(D) notification before invitation of bids shall also be ensured.

Yours Sincerely,

(Rohin Kumar Gupta)
Executive Engineer (NFSG)
For DG (RD) & SS

Copy to:

R.O., MoRT&H, Mumbai. It is requested to co-ordinate with the State PWD for expediting the submission of project documents for the afore-said projects.

(Rohin Kumar Gupta)
Executive Engineer (NFSG)
For DG (RD) & SS