Diversion of 7.2834 hac. of Forest Land for Rehabilitation and Upgradation to Four Lane Configuration and Strengthening of Sihuni to Rajol (Package IIA) from KM 51.00 to KM 72.00 (Design Length of 18.450 km) of NH 20 (New NH 154) of Pathankot Mandi Section in the State of Himachal Pradesh	
FILE NO.	: **FP/HP/Road/152261/2022**
DATE OF PROPOSAL	: **15.07.2022**

CHECK LIST SERIAL NUMBER – 34 (f)

PLANTATION MODEL FOR ABSORPTION OF CO_2

1.1 INTRUDUCTION

This Chapter deals with Green Corridor planning for the propose road which includes project specific greening program consisting of avenue and median plantations, maintenance and cost estimation.

1.2 OBJECTIVES OF GREEN CORRIDOR PLANTATION PLAN

The green corridor plantation plan intends to make plantation an integral part of highway development process and to develop a systematic framework for integrated green corridor development along National Highways.

The objectives of plantation along the project road are:

- To reduce the impacts of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants
- Provide shade on glaring roads during summer/sunny days
- To reduce the impact of noise pollution caused due to increase in number of vehicles
- To arrest soil erosion at the embankment slopes.
- Prevent glare from the headlight of incoming vehicles
- Moderating the effect of wind,
- Employment opportunities for local people,

Avenue Plantation, Median Plantation and maintenance have been planned in accordance with IRC SP-21:2009 quidelines for tree plantation and landscaping which provide comprehensive guidelines on landscaping of roads with respect to the physiographical, environmental climatic and operational factors

1.3 PROPOSED RIGHT OF WAY

The proposed Right of Way varies and is considered as per the applicable Typical Cross Sections. The plantation along the road side has been proposed as per the width available after earthwork or toe line.

1.4 PROJECT SITE SCENARIO.

The project road is passing through the districts of Kangrar and Chamba. The terrain of the Kangra district is mostly hilly and undulating Kangra district presents an intricate mosaic of mountain ranges, hills and valleys. The climate of the study area varies from sub-tropical to sub-humid.

1.5 PLATATION PATTERN

As per "Green Highway (Plantation Transplantat on. Beautification and Maintenance). Policy 2015" of Ministry of Road Transport and Highways Government of India, Single row of avenue plantation has been proposed on either side of the project roads at 3 m interval (333 no. trees/km). Therefore, 666 no of trees will be planted on both side of the project roads per km Number of rows of Avenue trees to be planted will depend upon the area available for avenue plantation in PROW Technical specification of avenue plantation is presented in Table 1.1

TABLE 1.1 : TECHNICAL SPECIFICATION FOR PLANTATION

Items	**Description**
No. of Rows	1 row on each side of road outside drain line
No. of Trees per km	666 trees / km (both sides)
Spacing between the plants	3 m
Size of Pits	60 x 60 x 60 cm
Height of Plants	1.5 to 2 m
Age of Plants	Not less than 2 years

Note :

- Number of rows of trees to be planted per km will depend upon the road width available for avenue plantation in PROW Avenue plantation has not been proposed where available width is less than 1m.from the toe line.
- No median plantation is proposed.

1.6 SELECTION OF SPECIES

Trees, shrubs and grasses are used to enhance the natural ambience of an area. The species for plantation have been decided as per the climate (temperature and rainfall), topography, resistance to pollutants, capacity of the absorptions of CO, and adverse environmental conditions, physical growth characteristics of trees, like form and shape. foliage pattem, canopy type. branching pattern, soil characteristics and conditions of the strip like water logged areas etc. Preference for plantation has been given to native species and provided in the table below :

Sr. No.	Common Name	Botanical Name
1.	Neem	Azadirachtaindica
2.	Kachnar	Bauhinia variegata
3.	Gulmohar	Delonixregia
4.	Banjh Oak	Quercus leacotrichophora
5.	Kumkum	Mallotus philippensis
6.	Babool	Acacia nilotica
7.	Arjun	Terminalia arjuna
8.	Amaltaas	Cassia fistula
9.	Tun	Cedrela toona
10.	Drek	Melia azadirachta
11.	Harad	Terminalia chebula
12.	Shisham	Dalbersia sissoo
13.	Demur	Ficus roxburghii
14.	Nepal Black Cedar	Alnus nepalensis

1.7 COSTING

For the purpose of calculating the cost of plantation along roadside and median with a maintenance period of 5 years, MoRDSOR under MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) has been used. The per unit tree cost of plantation and maintenance for 5 years is approximately Rs. 1500. Accordingly, the total cost worked out for the project road is as under.

Cost Component	Length available for Plantation	No. of trees Proposed	Per Unit Cost of Plant	Total Cost (in INR)
Avenue Plantation	**18.450**	**12288**	**1500**	**18432000**
Overall Cost of Plantation				**1,84,32,000**

Vikas Surjewala
G.M. / Project Director
NHAI, PIU Palampur
District Kanga, (H. P.)

Place : Palampur
Date : 26-01-2023

Countersigned by :

Dr. Sanjeev Sharma (HPFS)
(Nodal Officer)
Divisional Forest Officer
Dharamshala Forest Division
Dharamshala

Divisional Forest Officer
Forest Division
Dharamshala