Office of Superintending Engineer
World Bank Project Circle
P.W.D., Kanpur

E-mail:- sewbpwdkanpur@gmail.com

Letter No.:- 800 / 5C-WBPCK / 2023 **Date:- 08.05.2023**

To,

The Divisional Forest Officer,
Forest Department
Jhansi

Sub: Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh – **(Online Forest Proposal No.- FP/UP/ROAD/117342/2020) Regarding Regional Empowered Committee's (REC) EDS Compliance Status Report**

Ref.: REC (MoEFCC), IRO Lucknow MOM No. 11/1092/REC/2014/U.P./2191 Dated 27.02.2023
- DFO, Jhansi to UPPWD ref. no....

Sir,

We refer to the above REC Minutes of Meeting (MoM) and the discussions we had on subject matter. Kindly find a point wise reply of user agency on the essential details sought by the Regional Empowered Committee's REC, IRO(MOEFCC) Lucknow as below:

Sl.	Observation of REC, MOEFCC (Lucknow)	Status of Compliance or Required Action
1.	As per the DSS and SOI topo sheet, the demarcation of forest area proposed for diversion is undervalued. Some parts of the Reserve Forest area in the KML file are demarcated as Non-forest. This needs rectification/clarification.	Jhansi Forest Department on 01.03.2023 has reconducted the joint ground verification along with the UA with respect to the KML file and other maps(**Annexure-1**) submitted with the proposal. It has been reverified and confirmed that the measurement of forest area under each land survey number is correct. Also a number of existing side roads joining the main carriageway belong to UPPWD hence not forest land. Based on the assessment, you are requested to submit the clarification to Nodal Officer/ REC, MoEFCC conforming that the proposed forest area under diversion is not undervalued and is matching with the area submitted for the division in the proposal i.e. 13.049 Ha. out of Total Forest Diversion under Proposal i.e. 18.1854 ha.
2.	As per the DSS and SOI toposheet, the proposed NFL CA land polygon falls under the Kuchhechha R.F and Durkhuru R.F area. This needs rectification/ clarification.	Proposed CA land of village Raipura has been re-examined by Jhansi Forest Department in coordination with UPPWD on 01.03.2023. After detailed examination Forest Range office reconfirmed that the proposed CA land is correctly demarcated and does not falling under Durkhuru R.F. The signed copy of the Re-verification/ examination report is enclosed herewith as **Annexure-2.2.** There is no requirement of any fresh/new Non-Forest CA Land.
3.	As per part-ii of the proposal, total no. of trees proposed for felling is 2454 trees but in State Govt. forwarding letter, it is mentioned as 2554 trees. This needs rectification/ clarification.	This typological error is committed in the Letter forwarded which was issued by the State Government and can be corrected while submitting the compliance to REC, MOEFCC. The total number of affected trees is correctly mentioned in part-II of the proposal i.e. 2454 and division wise details are as below: 1. Hamirpur Division- 327 (PF-41 & RF-286) 2. Jhansi Division - 2127 (RF)
4.	NOC from irrigation dept. needs to be submitted since the propose diverted route	NOC from Irrigation Department is not required as the major bridge over the river Dhasan has been already

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	is crossing the river.	constructed and is under maintenance of UPPWD (Provisional Division) Jhansi since 2015. This structure does not belong to the Irrigation Department. The existing structure has to be retained as it is and the existing structure shall be retained in its current condition.
5.	It is not clear from the proposal that what is the status of widening before and what is after proposed alignment.	The widening varies throughout the alignment proposed under project. The list of the Existing ROW, Proposed ROW is enclosed herewith as **Annexure-3** for reference.
6.	Detailed Muck calculation and muck disposal scheme as approved by concerned DFO needs to be submitted.	Muck disposal certificate duly certified by the DFO is already submitted in the Forest diversion proposal. However, as per the REC, MoEFCC comments, a detailed calculation of muck and its disposal plan is finalized by the consultant and enclosed as **Annexure-4** for your reference.
7.	Details of existing ROW, Proposed ROW and land width (ROW) availability for road side plantation needs to be submitted and accordingly plantation scheme for roadside plantation needs to be submitted.	The widening varies throughout the alignment proposed under project. The list of the Existing ROW, Proposed ROW is enclosed herewith as Annexure-3 for reference. The Tree Plantation shall be carried out based on the availability of space within ROW. A detailed roadside plantation scheme on Typical Cross Sections is enclosed herewith as **Annexure-5**.

You are requested to review and take necessary actions so that the Forest clearance for this project can be obtained MoEF&CC at the earliest.

Encl.: As above.

(RAKESH VERMA)
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(Rakesh Verma)
Superintending Engineer
World Bank Project Circle
P.W.D., Kanpur

Copy- To the following for information and necessary action.

4. Executive Engineer, PWD-WB Division, Kanpur.
5. TL(PMC), Egis India Consulting Engineers Pvt. Ltd., Lucknow.
6. Dr. Seema Srivastava, Environment Expert-ESDC, Lucknow.

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ANNEXURE-1

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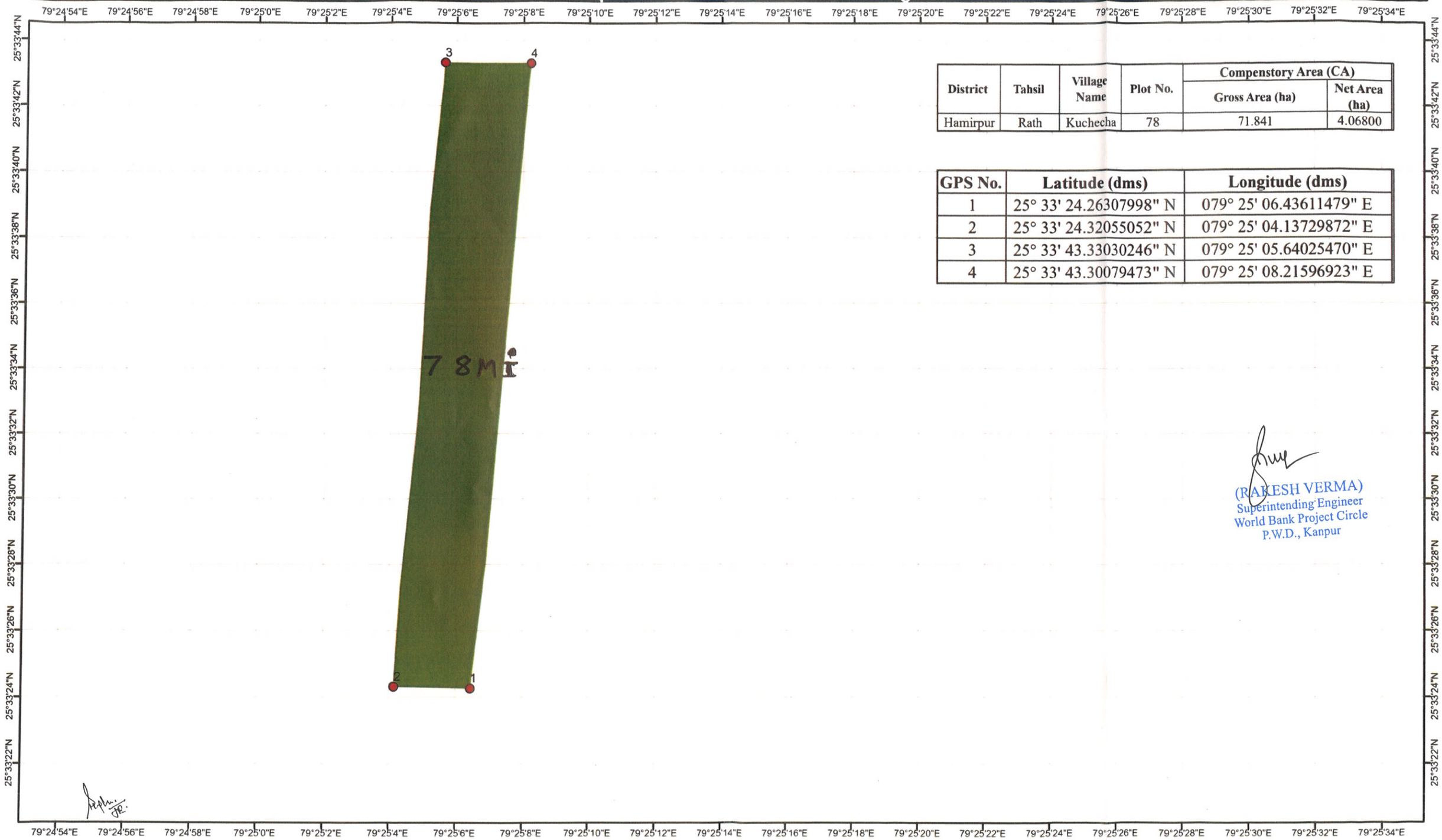
ANNEXURE-1

Annexure-1

Digital Georeferenced GIS Map of Proposed CA Land in the Range of Kuchecha,District Hamirpur Under Proposed UPCRNDP-SH42 Missing Link



District	Tahsil	Village Name	Plot No.	Compenstory Area (CA)	
				Gross Area (ha)	Net Area (ha)
Hamirpur	Rath	Kuchecha	78	71.841	4.06800

GPS No.	Latitude (dms)	Longitude (dms)
1	25° 33' 24.26307998" N	079° 25' 06.43611479" E
2	25° 33' 24.32055052" N	079° 25' 04.13729872" E
3	25° 33' 43.33030246" N	079° 25' 05.64025470" E
4	25° 33' 43.30079473" N	079° 25' 08.21596923" E

(RAKESH VERMA)
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P.W.D., Kanpur

USER AGENCY

UP Core Road Network Development Project (UPCRNDP)
Public Work Department (PWD)
Government of Uttar Pradesh

CONSULTANT

egis
Egis India Consulting Engineers Pvt Ltd.
Egis Tower , Plot No. 66, Sector-32,
Gurgaon, Haryana-122001, India

MAP SCALE

1:3,200 @A3

N

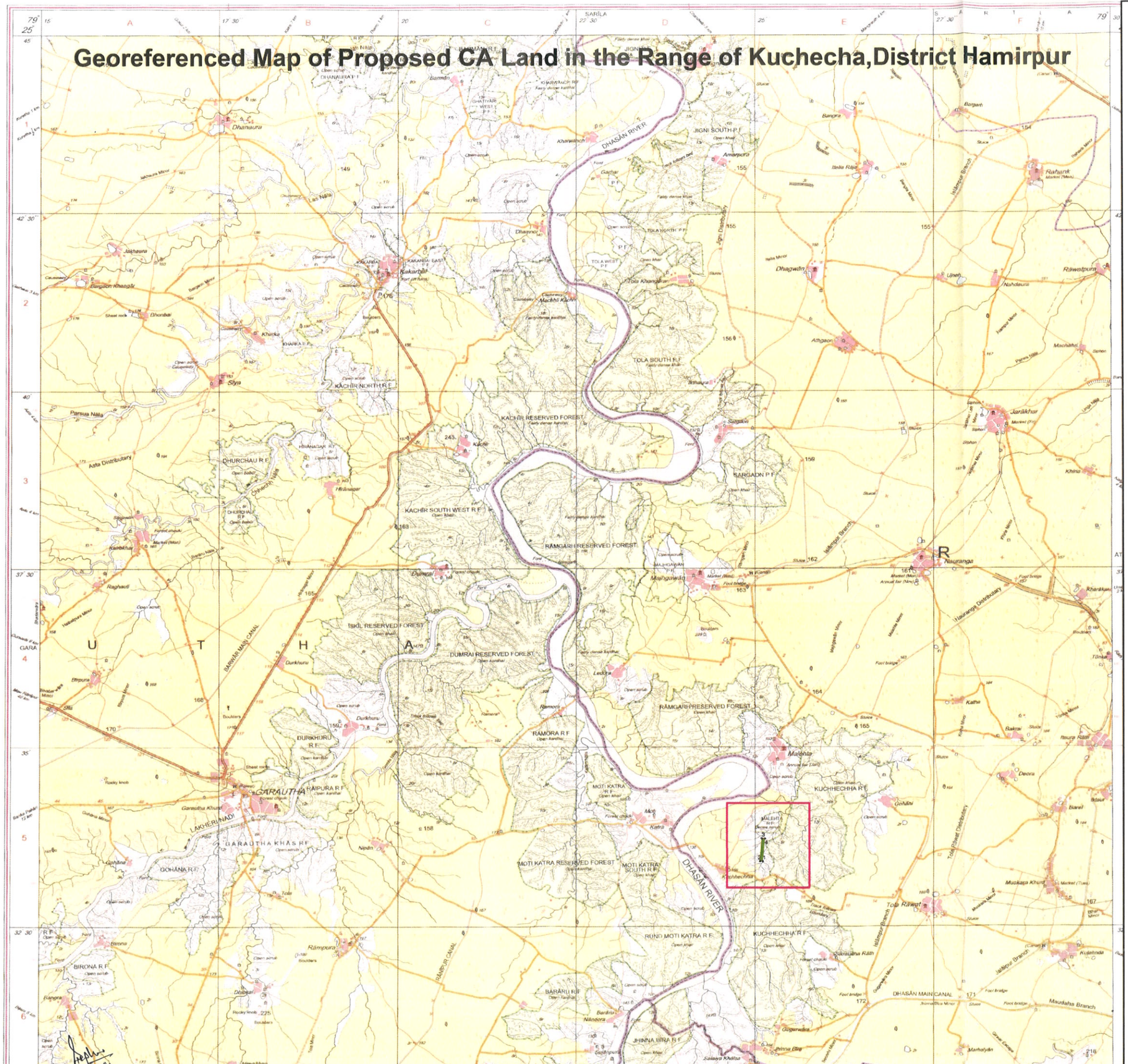
0 28.75 57.5 115 172.5 230
Meters

LEGEND

GPS Co-ordinate
Compensotry Non Forest Land

TITLE

Project :Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh, FP/UP/ROAD/117342/2020



ANNEXURE-1

Georeferenced Map of Proposed CA Land in the Range of Kuchecha,District Hamirpur

Key Map

PROJECT

Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh, FP/UP/ROAD/117342/2020

LEGEND

- • GPS Co-ordinate
- 🟩 Compensotry Non Forest Land

SCALE

1:50,000

N

0 0.571.15 2.3 3.45 4.6

Kilometers

District	Tahsil	Village Name	Plot No.	Compenstory Area (CA)	
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USER AGENCY

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World Bank Project Circle
P.W.D., Kanpur

UP Core Road Network
Development Project (UPCRNDP)
Public Work Department (PWD)
Government of Uttar Pradesh

CONSULTANT

egis

Egis India Consulting Engineers Pvt Ltd.
Egis Tower , Plot No. 66, Sector-32,
Gurgaon, Haryana-122001, India

Annexure-2.2

संयुक्त निरीक्षण आख्या

आज दिनांक 01.03.2023 को प्रभागीय वनाधिकारी, झांसी के कार्यालय पत्रांक 3385/15–1, दिनांक 28.02.2023 के अनुपालन में बामौर रेंज के अन्तर्गत हमीरपुर–राठ–गरौठा–गुरसरांय झांसी राज्य राजमार्ग 42 के निर्माण में प्रभावित आरक्षित वन भूमि 13.049 हे0 के समतुल्य क्षतिपूरक वृक्षारोपण हेतु मौजा रैपुरा के गाटा संख्या 528 मि0, रकवा 9.033 हे0 एवं गाटा सं0 537, रकवा 4.016 का स्थलीय निरीक्षण विश्व बैंक परियोजना वृत्त लोक निर्माण विभाग कानपुर के अवर अभियन्ता श्री मुहम्मद साजिद व पर्यावरण इन्जीनियर श्री देववृत्त सिंह व राजस्व विभाग के लेखपाल श्री राजेन्द्र सिंह कुशवाहा व विभागीय सर्वेयर श्री सुरेश कुमार व श्री राजेन्द्र कुमार कुशवाहा, वनदरोगा एवं अद्योहस्ताक्षरी के द्वारा किया गया। निरीक्षण में पाया कि मौजा रैपुरा की गाटा सं0 528 मि0 रकवा 9.033 हे0 व गाटा सं0 537 रकवा 4.016 हे0 वन विभाग की भूमि नही है। उक्त भूमि बेहड़ श्रेणी 6–4 की भूमि है।

अतः रिपोर्ट आवश्यक कार्यवाही हेतु प्रेषित है।

01.03.23
(मो० साजिद अन्सारी)
अवर अभियन्ता
विश्व बैंक खण्ड लो.नि.वि.
छत्रपुर नगर

(DEVBRAT SINGH)
Env. Expert - Egis India
WB - Funded Project
EAP - UPPWD

1-3-23
सर्वेयर
सुरेशलाल
व.द.

(राजेन्द्र कुमार)
व.द.

1-3-2023
क्षेत्रीय वनाधिकारी
बामौर (झाँसी)

(RAKESH VERMA)
Superintending Engineer
World Bank Project Circle
P.W.D., Kanpur

Name of Project Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh (FP/UP/ROAD/117342/2020)

Annexure-3

Existing and Proposed ROW

S. No.	Chainage		Length	Existing ROW	Proposed ROW
	From	To	in Km.		
1	74.550	81.887	7.337	0	30
2	81.887	83.500	1.613	14	30
3	83.500	83.700	0.200	0	30
4	83.700	84.450	0.750	22	30
5	84.450	88.200	3.750	0	30
6	88.200	89.600	1.400	10	30
7	89.600	90.430	0.830	0	30
8	90.430	90.800	0.370	15	30
9	90.800	91.030	0.230	0	30
10	91.030	91.400	0.370	12	30
11	91.400	91.600	0.200	0	30
12	91.600	92.500	0.900	14	30
13	92.500	92.700	0.200	0	30
14	92.700	93.500	0.800	8	30
15	93.500	94.130	0.630	0	30
16	94.130	94.320	0.190	8	30
17	94.320	94.800	0.480	0	30
18	94.800	96.000	1.200	0	30
19	96.000	96.570	0.570	9	30
20	96.570	97.820	1.250	0	30
21	97.820	97.920	0.100	10	30
22	97.920	98.400	0.480	0	30
23	98.400	98.435	0.035	0	30
24	98.435	99.075	0.640	0	50
25	99.075	99.415	0.340	0	30
26	99.415	100.044	0.629	0	40
27	100.044	100.423	0.379	0	30
28	100.423	100.694	0.271	0	40
29	100.694	102.400	1.706	0	30
30	102.400	103.080	0.680	0	30
31	103.080	103.400	0.320	10	30
32	103.400	103.600	0.200	0	30
33	103.600	103.800	0.200	10	30
34	103.800	104.150	0.350	0	30
35	104.150	104.600	0.450	8	30
36	104.600	106.290	1.690	0	30
37	106.290	106.400	0.110	15	40

(RAKESH VERMA)
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World Bank Project Circle
P.W.D., Kanpur

Name of Project Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh (FP/UP/ROAD/117342/2020)

Annexure-3

S. No.	Chainage		Length	Existing ROW	Proposed ROW
	From	To	in Km.		
38	106.400	107.020	0.620	0	30
39	107.020	107.100	0.080	0	30
40	107.100	108.582	1.482	0	30
41	108.582	109.084	0.502	0	50
42	109.084	109.233	0.149	0	30
43	109.233	109.395	0.162	0	0
44	109.395	109.445	0.050	13	50
45	109.445	110.360	0.915	13	19.50

JE

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Superintending Engineer
World Bank Project Circle
P.W.D., Kanpur

Annexure-4

MUCK DISPOSAL PLAN

Name of Project: Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh (FP/UP/ROAD/117342/2020)

Checklist Serial No. -9.29

Muck Disposal Plan

This is certified that entire quantity of this excavated material will be reused for construction of subgrade and earthen shoulders of the project road. No muck for the proposed project is envisaged and therefore no disposal is required for it.

S.No	Details	Quantity	Unit
	Materials received from Hillside cutting	Nil	Cum
	Materials received from cutting including 40% of swell factor	Nil	Cum
	Total	Nil	Cum
	Disposal & Use of Material	Nil	Cum
1.	R.R. stone Masonry laid in 1.5	Nil	Cum
2.	R.R. stone Masonry laid dry	Nil	Cum
3.	Hand packed stone filling	Nil	Cum
4.	Construction of wire Crete	Nil	Cum
5.	Construction of parapet	Nil	Cum
6.	Construction of Granular sub-base /base/surface	Nil	Cum
7.	Construction scupper	Nil	Cum
8.	Construction of roadside drain	Nil	Cum
9.	Super elevation & Patri Filling	Nil	Cum
10.	Concrete work	Nil	Cum
11.	Total	Nil	Cum
12.	Material Disposal by Carriage	Nil	Cum

Summary of Debris Disposal

S. No	Total Material	Material Disposal	Resided Material for road construction	Total Disposal in Dumping zone
1.	Nil	Nil	Nil	Nil

Details of Muck Disposal Site

S. No	Location of Dumping Yard	Owner of the Land	Khasra No	Area (Ha.)	Height of the Dumping Zone (m)	Capacity of the Dumping Zone Yard	Latitude and Longitude
1.	Nil	Nil	Nil	Nil	Nil	Nil	Nil

(RAKESH VERMA)
Superintending Engineer
Superintending Engineer, Kanpur Circle
Uttar Pradesh Public Works Department (UPPWD),
Govt. of Uttar Pradesh

Date:
Place: Lucknow

Name of Project: Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh (FP/UP/ROAD/117342/2020)

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(RAKESH VERMA)
Superintending Engineer
Superintending Engineer, Kanpur Circle
Uttar Pradesh Public Works Department (UPPWD),
Govt. of Uttar Pradesh

Date:
Place: Lucknow

No Hillside cutting;
However, Earth generated from roadway cutting & drain excavation that shall be re-used for embankment construction .

Estimated Qty. generated

506131 cum

Usable for Embankment	Not suitable for Embankment
354500 cum	151631 cum

Estimated Qty. for Emb. Construction

882936 cum

Source of Emb. Material

Fly Ash	Borrow Earth
212800 cum	315636 cum

Shall be reused for Grass Turfing on embankment slope i.e approx. area is about 619218 sqm

Material Obtained from Dismantling of Existing C/w	
Bitumen Crust	GSB/Agreegate Crust
3149 Cum	18556 Cum
Reuse as RAP Material	Reuse as GSB Construction
Estimated Required Qty. for Project	
44721 Cum	179831 Cum
Shall be Procured from Quarry	
41572 Cum	161275 Cum
Total 202847 Cum	

No surplus materials or muck will be available for disposal in to dumping land out site of Project area.

(RAKESH VERMA)
Superintending Engineer
World Bank Project Circle
Kanpur

13.1 MDP

egis

ANNEXURE-4

Name of Project Construction of 2-lane missing link road from Rath Bypass (Hamirpur District) to Garautha (Jhansi District) of SH-42 in the State of Uttar Pradesh (FP/UP/ROAD/117342/2020)

UTTAR PRADESH CORE ROAD NETWORK DEVELOPMENT PROJECT

MUCK DISPOSAL PLAN

PROPOSAL FOR DIVERSION OF 18.1854 HA OF FOREST LAND FOR THE CONSTRUCTION OF 2-LANING MISSING LINK ROAD OF HAMIRPUR-RATH-GARAUTHA-JHANSI ROAD FROM RATH BYPASS KM-74+550 (HAMIRPUR DISTRICT) TO GARAUTHA KM-110+360 (JHANSI DISTRICT) OF SH-42 IN THE STATE OF UTTAR PRADESH

1. The Forest Proposal has been prepared as per revised forest (Conversation) rule 2003 under Forest (Conservation) Act 1980 to obtaine the forest clearance from Govt. of India for diversion of forest land purpose to develop the SH-42 from Rath bypass (Km 74+550) to Garautha (Km 110+360).

2. As the proposed road section traversing through plains, no hill cutting involves. However it has been estimated that due to roadway cutting and drain excavation approximately 14,106 cum of muck is to be disposed off per km. With this rate, for 35.881 km 5,06,131 cum of muck is to be disposed off. Out of this around 70% of muck will be utilized for embankment filling during sub-grade and earthen shoulders construction i.e 3,54,500 cum. Hence the quantity of unusable muck which is to be disposed off = 30 % of 5,06,131 = 1,51,631 cum, which is not usable, will required to be disposed off.

3. Our road development includes the protection of embankment slopes hence the unusable excavated quantity of 1,51,631 cum i.e usually back-cotton top soil that shall be utilized for side slopes filling and raising and leveling the remaining ROW fill sections for profile correction to smooth flow of run-off water during rainy season.

4. Available side slopes and raising and leveling the remaining ROW fill sections is approximate (average 4 m emb.slope + 4 m ROW, 34.4 km road length excluding bridges) = 6,19,218 sqm for grass turfing. The treatment of embankment slopes shall be carried-out as per recommended practice IRC-56-1974 for erosion control.

5. The metal crust materials obtained from existing roadway excavation shall be utilized for the construction of proposed road as per MoRTH guidelines and specification in the GSB and bitumen layers respectively.

6. No surplus materials or muck is available in proposed project road for disposal in to dumping land out site of project area.

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Superintending Engineer
World Bank Project Circle
P.W.D., Kanpur

egis

ANNEXURE-5

TREE PLANTATION STRATEGY

The sustainable economic development depends on the rational use of environmental resources and minimizing, to the extent possible, adverse environmental impacts through improved project selection and more responsible project planning and design. Under this strategy the development must be environmentally sound in the broadest sense. In highway development, environmental planning is concerned with good blending of improvements of physical, social, and economic parameters. It involves not only the environmental (land, water, and air) but is also concerned with integration to local, regional and national socio-economic development.

Road development can have wide ranging environmental impacts. This is because roads extend over long distance and by promoting rapid communication they can catalyze dramatic changes in land use patterns. Soil degradation, loss of top soil and reduction of the productive capacity of the soil covered by the road, which is significantly reduced further as a result of compaction with heavy machinery during construction, is one of the most immediate effects. Landscape and aesthetic distortions due to road development leads to modifications in the regional landscape and changes in the natural relief and morphology of the, vegetation, inclusive of avenue trees and recreational areas. But these impacts can often be significantly reduced through environmentally-sound construction and operation management practices. Careful consideration and assessment of the surrounding environment in road construction and improvement will reduce disruption costs and harmful effects while increasing usage and benefits. Therefore a proper landscape plan should be made which will protect the road from soil erosion, sinking and also to maintain the aesthetic beauty. It will also reduce land, water, air and noise pollutions as well.

Aim and Objective of Tree Plantation:-

- To create green belt and avenues for meeting aesthetic recreational needs to the people.
- To beautify the areas for scenic beauty.
- To reduce the surface run-off discharge and checking soil erosion along the embankments.
- To reduce the encroachment of road reserve areas.
- To reduce temperature and increase humidity.
- To reduce noise pollution to the neighboring household population.
- To reduce the impacts of air pollution and dust as trees and shrubs are known to be natural sink for air pollutants.
- To provide much needed shade on glaring hot roads during summer.
- Moderating the effect of wind and incoming radiation.
- To define the ROW especially highlight sharp horizontal curves during night.
- To promote road development as eco friendly activity.

Tree Plantation Strategy

Plantation is one of the most important constituents of soft landscaping. Trees, shrubs and climbers have been used to enhance the soft natural ambience against harsh elements in most of the enhancement schemes. The planting species are decided based on the physical growth characteristics of trees, like form and shape, foliage pattern, growth rate, branching pattern, soil characteristics etc. While selecting the species of trees for landscaping a great care should be taken to choose the species, which already exist on the project corridor. The tree plantation will be carried out in accordance with the IRC: SP: 21:2009 guidelines and specifications.

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P.W.D., Kannur

Plantation Pattern

Depending on the availability of the ROW, plantation pattern is worked out as follows:-

1. The first row along the highway to be planted with small to medium sized ornamental trees.
2. Subsequent rows depending on the availability of land will comprise of ornamental or shade bearing species of more height than those in the first row. Since the proposed Highway section is passing through the rural sections, the last row will always be of shade bearing tall trees. Five rows of trees are proposed to be planted on either side.
3. Planting of shrubs in the median.
4. Planting of herbaceous species as ground cover in the median, special landscapes on embankment slopes.
5. Turfing with grasses in the median and embankment slopes.
6. The last row to be planted with tall shade bearing trees for better road safety and for enhancing aesthetics.

Tree Plantation along the Highway Section

1st Row

The first row of plantation along the highway section should be worked out by ornamental species. Since the proposed highway section is passing through the rural areas, the following species are recommended for the 1st row of avenue plantation.

Table 1.0 Species recommended for 1st row plantation

S. No.	Botanical Name	Local Name
1	*Cassia fistula*	Amaltas
2	*Terminalia arjuna*	Arjun
3	*Delonix regia*	Gulmohar
4	*Bauhinia sps*	Kachnar
5	*Cassia nodusa*	Cassia

2nd Row

The 2nd row of plantation along the Project stretch should be worked out by ornamental species of more height i.e. medium height trees, than the first row. The following species are recommended:-

Table 2.0: Species recommended for subsequent row plantation

S. No.	Botanical Name	Local Name
1	*Melia azadiracta*	Bakain
2	*Pongamia pinnata*	Kanji
3	*Gravillea robusta*	Silver Oak
4	*Albizzia lebbek*	Kala siris
5	*Dalbergia sissoo*	Shisham

Subsequent Rows

The subsequent rows of plantation along the Highway section have been worked out. The tall shade trees like Peepal, Neem, Mango, Shisham etc have high crown and secure better visibility. They have a long gestation period and has rapid growth and capacity to resist disease and pests attack are therefore ideal. These shaded trees should be planted at a spacing of 12m C/C.
The tree species recommended as shade plants for roadside avenues are given the following table:-

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Table 3.0: Species recommended for Subsequent rows

S. No.	Botanical Name	Local Name
1	*Ficus religiosa*	Peepal
2	*Ficus infectoria*	Paker
3	*Madhuca indica*	Mahua
4	*Dalbergia Sissoo*	Shisham
5	*Azadirachta indica*	Neem
6	*Mangifera indica*	Mango
7	*Tamarindus indica*	Imli
8	*Syzynium cuminij*	Jamun

Shrub plantation for Median

The species to be planted in median would be of low or medium height with ornamental value to enhance the visual experience of the road corridor. It will also act as a screen to prevent glare from the incoming vehicles. Depending on the width of the median, which is 6.0 m, two rows of flowering shrubs will be provided. Some herbaceous species may also be planted as a ground cover on the median.

Table 4.0: Species recommended for Median

S. No.	Botanical Name	Local Name
1	*Thaventia nerifolia*	Kaner
2	*Bouganvillea sps.*	Bouganvillea
3	*Ipomia*	

Plantation along the Embankments

On the embankment slopes, some herbaceous species followed by grasses turf will be provided. The species proposed for the purpose of turfing are Cynodon dactylon, Cythocline perpurea, Solanum Nigrum, Alternanthera, Chlorophytum, Eupatorium, Wedelia, Duranta, Portulacca, Ipomea, Pelia Cadrii, Asparagus, Opheopogon grass etc.

Technical specifications for planting along the Highway section are as follows:

1. Ornamental plants except last row

- Distance from embankment : 1.0m away from the toe of the embankment
- Spacing between plant to plant : 3m
- Spacing between rows : 3m
- Size of the pits : 60x60x60 cms
- For alkaline soils : By auger
- Water logged areas : mounds with height varying depending on the water level
- Species recommended : Listed in **Table 1.0** and **Table 2.0.**
- No of plants per Km : 333
- Height of plant : 1.5 to 2m

2. Shaded plants (Last row)

- Distance from the preceding row : 3.0m
- Spacing between plant to plant : 12m
- Size of the pits
- Normal size : 60x60x60 cms
- For alkaline soils : By auger
- Water logged areas : mounds

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- Species recommended : Listed in **Table 3.0**
- No of plants per Km : 84
- Height of plant : more than 2m

In localities where a really bad patch of USAR occurs recommendations are to be strictly followed for better survival of plants. Deep pits to be dug and soil amender Gypsum 1 Kg to 3 kg with 2 kg compost and sand are to be filled before planting the plants.

For multiple row plantations, five strand barbed wire fencing, with cross strands, stretched on angle iron poles fixed at a distance of 4 meters from one another are to be provided as per recommendations. Live fencing/ bamboo fencing/ thorn fencing may also be used where protection can be ensured through these.

3. Shrubs (For Median/ Embankment)

The surface is to be prepared adequately for shrubs planting or grass sowing. The grasses and shrub planting is done to provide a strong surface cover but needs a well-prepared surface. All masses of loose debris will be removed.

- Size of the pits for planting shrubs : 45x45x45 cms
- Species recommended : Listed in **Table 4.0**
- No of plants per Km : 666 (For two rows in the median)
- Use of compost and manure : 1/3 of volume of pit mixed with soil and refilled

The contractor will be required to water the area in case of insufficient rains after planting.

Plantation at Road Junctions/ Intersection and Traffic Islands

Road intersections are main nodal spaces and are of vital importance in terms of road aesthetics. Proper landscaping of the traffic islands and the surrounding areas shall integrate these features with surrounding landscape. The layout of traffic intersections shall be fixed by the traffic needs of the junction.

Plantation at the Sensitive noise receptors

All along the project corridor were sensitive receptors for noise such as educational institutions, hospitals, religious structure of community importance situated, the trees known for behaving as "noise barrier" will be proposed like- Neem (*Azadirachta indica*), Shisham (*Dalbergia sisso*), Imli (*Tamarindus indica*). Some flowering trees like Amaltas, Gulmohar, Kachnar, Asoka etc. can also done. Tall trees with thick canopies create a wind screen through which the air can be filtered and noise levels be considerably reduced. Some such trees are *Acacia auriculiformis* and *Greavillea Robusta*. At the sensitive noise receptors, tall shrubs of 1.5 – 3 m height like *Cassia biflora*, *Hamelia Patens* etc. can also be provided for maximum possible screening.

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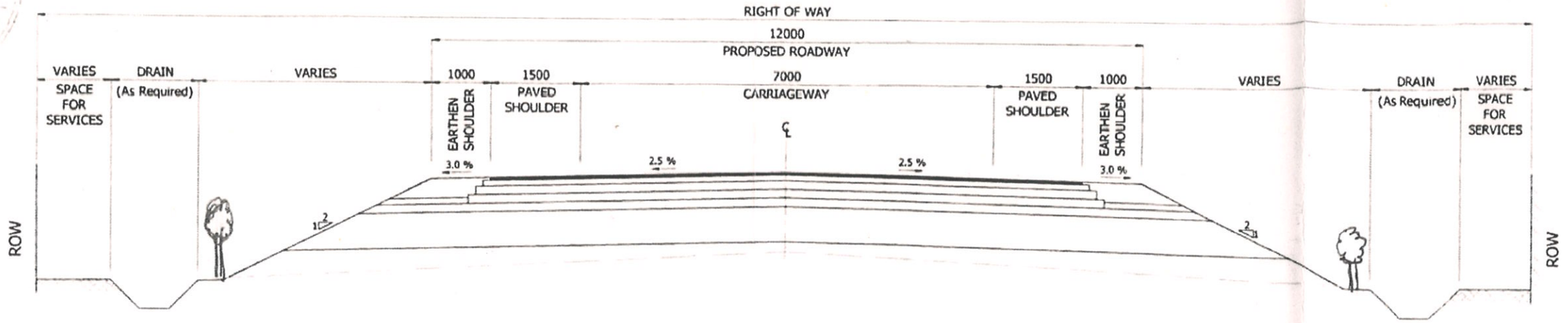
Annexure-5



TCS-1A - NEW CONSTRUCTION + BYPASS IN RURAL SECTION

Typical Cross Section Schedule		
Design Chainage (Km)		Cross section
Start	End	Type
74550	81959	1A
83460	83900	1A
84330	91660	1A
92400	95000	1A
96400	97840	1A
98460	98700	1A
99080	99420	1A
100020	100460	1A
100680	100800	1A
101200	101770	1A
102200	103200	1A
103350	103600	1A
103760	104240	1A
104500	105700	1A
106000	106280	1A
106380	106860	1A
107730	107860	1A
108080	108860	1A

Notes: –
1. Not to Scale.
2. All dimensions are in mm unless otherwise mentioned.
3. Safety Barrier as per Standard Drawing.
4. Toe Wall as per Standard Drawing.
5. Section of Earthen Drain as per Engineer Advice.

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CLIENT:-	CONSULTANT:-	PROJECT:-	SCALE:-			Revisions			TITLE
Government of Uttar Pradesh Public Works Department	egis India consulting engineers pvt. ltd.	Uttar Pradesh Core Road Network Development Program (UPCRNDP) Part-A: Project Preparation (Rath-Garautha Section of SH-42)	N.T.S	Prepared by	Maninder Vashisth	Rev.	Date	Description	TYPICAL CROSS SECTIONS
				Designed by	Nabil Kumar	R0	Apr 2021	FOR TENDER PURPOSE	
				Checked by	Sanjay Kumar				DRG. NO.
				Approved by	Mohamed Ayaz Beg				EGIS/DPR/EIRH1UP020/DPR/TCS- 001
				Date	Apr 2021				

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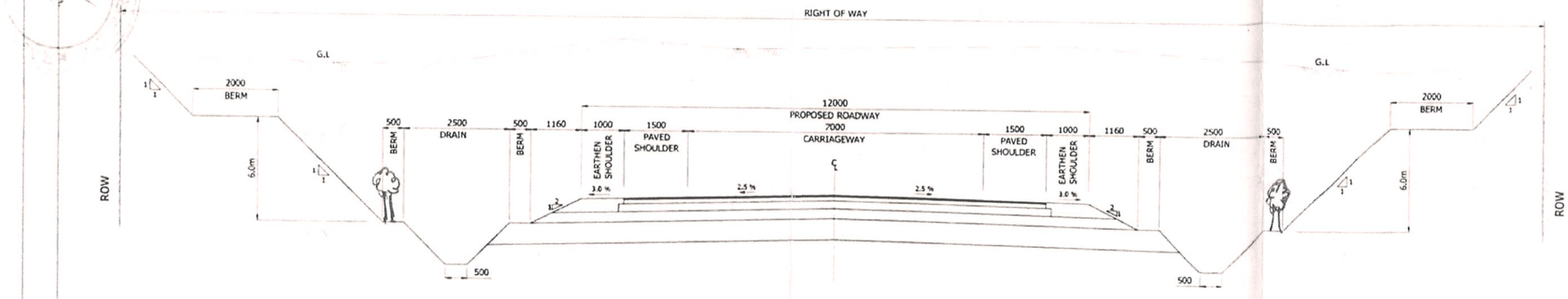
Annexure-5



TCS-1D - NEW CONSTRUCTION + REALIGNMENT / BYPASS IN CUT SECTIONS (RURAL SECTION)

Typical Cross Section Schedule		
Design Chainage (Km)		Cross section
Start	End	Type
98700	99080	1D
99420	100020	1D
100460	100680	1D
105700	106000	1D
106280	106380	1D
106860	107730	1D
107860	108080	1D

Notes: -
1. Not to Scale
2. All dimensions are in mm unless otherwise mentioned
3. Safety Barrier as per Standard Drawing
4. Toe Wall as per Standard Drawing
5. Section of Earthen Drain as per Engineer Advice

EXTERNALLY AIDED PROJECT * LUCKNOW * Chief Engineer UPPWD

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CLIENT - Government of Uttar Pradesh, Public Works Department	CONSULTANT - egisIndia consulting engineers pvt. ltd.	PROJECT - Uttar Pradesh Core Road Network Development Program (UPCRNDP), Part-A: Project Preparation, (Rath-Garautha Section of SH-42)	SCALE:- N.T.S	Prepared by: Maninder Vashisth; Designed by: Nisha Kumar; Checked by: Sanjay Kumar; Approved by: Mohamed Ayaz Beg; Date: Apr 2021	Revisions: Rev. RG; Date Apr 2021; Description FOR TENDER PURPOSE	TITLE: TYPICAL CROSS SECTIONS	DRG. NO: EGIS/DPR/EIRH1UP020/DPR/TCS- 004

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