



भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
National Highways Authority of India

(सड़क परिवहन और राजमार्ग मंत्रालय)

(Ministry of Road Transport & Highways)

परियोजना क्रियान्वयन इकाई - बागपत

Project Implementation Unit, Baghpat

फ्रेंड्स कॉलोनी, निकट पी.डब्ल्यू.डी. गेस्ट हाउस, बडौत रोड, जिला-बागपत - 250609

Friends Colony, Near PWD Guest House, Baraut Road, District Baghpat - 250609

टेलीफोन: 0121-2222971

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भारतमाला
प्रगति के पथ पर अग्रसर
BHARATMALA
ROAD TO PROSPERITY

NHAI/PIU-BPT/1012/Greenfield/2021/D- 6841

Date:- 08-09-2021

To

Divisional Forest Officer

Baghu road, Meerut Rd,

near sugar mill, Baghpat, 250609

Sub: - "Development of 6 lane National Highway from the junction of Eastern Peripheral Expressway at Khekra to Saharanpur Bypass at Latifpur village from km 0.000 to km 118.533 of Delhi to Dehradun Economic Corridor under Bharatmala Pariyojana. Package-1 (km 0+00 to 27+000)" (online proposal no-FP/UP/ROAD/118170/2020.)

Ref: 1. EDS issued from MoEFCC, RO Lucknow vide letter no 8B/UP/06/193/2021/FC/277 dated 04/08/2021
2. Letter no. 223/14-1 dated 12/08/2021, EDS issued from office of DFO, Baghpat.


Sir

Please refer to the above captioned subject and aforementioned reference.

We herewith submit the compliance of above cited EDS. Point wise details of EDS compliance is annexed as attachment-1.

Being a priority project, we request to you kindly accept and submit it for onwards early processing of forest land diversion proposal.

Thanking You


8.9.2021

Project Director
NHAI-PIU, Baghpat

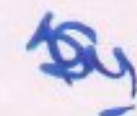
Compliance of EDS issued from MoEFCC, RO, Lucknow dated 04/08/2021

S.NO	EDS	COMPLIANCE
1	Part II is not recommended by concerned officer.	To be complied by office of DFO.
2	KML file submitted is for a stretch of 26 km. only while the proposal is for 118 km. this needs clarification	<p>Length of Project Road is approximately 118 km which starts from Eastern Peripheral (EPE) Expressway near village Khekra and connect existing Saharanpur Bypass.</p> <p>Further, the project road is divided in 4 construction package and only in package-1 having length approx. 26 km has forest patches at 3 locations along the existing cross roads and canal for which Forest Land Diversion Proposal is applied. These patches of Forest land are linear plantation along cross roads and canal which is further notified as Protected Forest.</p>
3	KML files of alternate routes needs to be submitted. Tree enumeration of alternate routes also needs to submitted	<p>Complied KML file of alternate route is submitted.</p> <p>Being a green field alignment project is categorized as Category A project, and it attracts Environmental clearance. During 239th EAC meeting dated 29-30 July 2021, in which ToR for EIA study is awarded, EAC committee (IA-III) of MoEFCC, reviewed all alternatives and they have consented the proposed alignment.</p> <p>Further, Environmental Clearance is also granted to this proposed alignment/project road on 258th Meeting of EAC dated 18.03.2021 (File no. 10-44/2020-IA.III, Proposal No. IA/UP/NCP/162955/2020).</p> <p>Since, project road alignment is already consented by Expert Appraisal Committee (EAC-IA-III) of MoEFCC, before applying forest land diversion proposal, forest joint enumeration is not done with forest official and other alternatives are not considered for development of project.</p> <p>KML file of alternative alignment is submitted separately in CD/Pen drive.</p>
4	No objection certificates of concerned departments Irrigation, PWD NHAI etc. need to be submitted.	<p>NHAI itself is applicant/User Agency of this project for which forest land diversion proposal is uploaded, accordingly NOC from NHAI is not applicable</p> <p>However, NOC from irrigation department is required and it is under process. Concerned office of the Executive Engineer has given consent, forwarded to the concerned senior official and its approval/issuing of NOC is under progress and approval is expected very soon.</p> <p>User Agency is agreed to obtain and submit all NOC during stage -1 clearance.</p> <p>Please refer Annexure-1</p>

08.9.2021


संजय कुमार मिश्रा/Sanjay Kumar Mishra
परियोजना निदेशक/Project Director
पी०आई०यू०-बागपत/P.I.U.-Baghat

5	Detailed muck calculation and much disposal scheme as approved by concerned DFO needs to be submitted.	<p>Complied</p> <p>This project is a green field alignment having PRow 70 meter and embankment height (in general) 2.00 to 2.5 meter located on plane terrain. Any cutting, tunnelling is not proposed and to raise the height of embankment additional earth material is required and no muck will be generated.</p> <p>Muck calculation and disposal scheme as per prescribed format (attachment no-07) is already attached.</p> <p>Further, as compliance of this EDS, approved/authenticated copy from office of DFO is uploaded/attached with forest land diversion proposal.</p> <p>Please refer Annexure-II</p>
6	Scheme of roadside plantation has to be provided.	<p>Complied</p> <p>Keeping in view of available RoW of project road 2 row avenue plantation (Both Side) along the project and 2 rows of shrub plantation in median has been provisioned. These plantations will be in accordance with IRC SP-21:2009/ Green Highway Policy 2015.</p> <p>Plantation strategy/scheme which is submitted to MoEFCC along with EIA report during award of Environmental Clearance is attached as Annexure-III</p>
7	It is not clear what is before and what is after proposed alignment.	<p>Project road is green field alignment/new alignment. Before the project road land use of the area on which greenfield alignment is proposed was/is predominantly agricultural. After, construction of project, it will be 6 laning access-controlled highway with 70-meter RoW.</p>
8	Component wise breakup of land required and component wise area calculation needs to be submitted. It needs to be checked that all components like Toll Plaza etc are part of this proposal (if forest area is affected).	<p>Forest land is required for carriageway. No forest area is affected due to establishment/construction of toll plaza / Rest Area.</p>



08.9.2021

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Annexure- I No objection certificate (in Progress) document

 **भारतीय राष्ट्रीय राजमार्ग प्राधिकरण**
National Highways Authority of India
(सड़क परिवहन और राजमार्ग मंत्रालय)
(Ministry of Road Transport & Highways)
परियोजना क्रियान्वयन इकाई - बारापत
Project Implementation Unit, Baghpat
फ्रेंड्स कॉलोनी, निकट पी डब्ल्यू डी हाउस, बरौत रोड, जिला-बारापत - 250609
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भारतमाला
गति मंत्रा
BHARATMALA
ROAD TO PROSPERITY

NHAI/PIU-BPT/1022/Greenfield/2020/D-5290 Dated: 14.01.2021

To,
Executive Engineer
Lower Division Yamuna Canal
Shamli

Sub: Consultancy Services for preparation of Detailed Project Report for development of Economic Corridors, Inter Corridors, Feeder Routes and Borders to improve the efficiency of freight movement in India under Bharatmala Pariyojana (Lot-7/Pkg5) for EPE - Saharanpur Bypass - Approval of GAD from Irrigation Department - reg.

Ref: DPR Consultant letter no. C-49 dated 12.01.2021

Sir,

This has with reference to the subject matter, it is to inform that a greenfield alignment Delhi - Saharanpur - Dehradun economic corridor under Bharatmala Pariyojana is being developed by NHAI and the alignment is crossing the irrigation channel at various locations. The GAD proposal for crossing of channel is enclosed herewith for your review and approval.

Accordingly, it is requested to review the enclosed GAD and give your consent/ approval so that same may be adopted in the proposal.

Thanking You,

Encl: As above.

Copy to: M/s MSV International Inc. in association with MSV International Tech. Pvt. Ltd for necessary persuasion.

*Recd
Varun Singh
16/1/21
7417619524*

Shubham K
19.01.2021
(Shubham Kamal)
Dy. Manager (Tech.)

कार्यालय अधिशासी अभियन्ता सिंचाई खण्ड बडौत (बागपत)

पत्रांक:- १०२६ /सि०ख०ब०बा०/NOC/


दिनांक:- ०७-०९-२०२१

विषय:- अनापत्ति प्रमाण पत्र निर्गत कराने के सम्बन्ध में।

सन्दर्भ:- NHAI/PIU-BPT/1022/Greenfield/2020/D-4910 Dated: 18-11-2020

अधीक्षण अभियन्ता ड्रेनेज मण्डल गाजियाबाद।

उपरोक्त के सम्बन्ध में सूचनीय है कि भारतीय राष्ट्रीय राजमार्ग प्राधिकरण द्वारा Irrigation Channel/नहर के ऊपर से दिल्ली-सहारनपुर-देहरादून हाईवे को नहर के ऊपर से क्रॉस करने के लिए प्रारम्भिक सर्वे के अनुसार सड़क की नहर पटरी से ऊँचाई UPID के मानक के अनुरूप रखी जाए। अग्रिम आवश्यक कार्यवाही हेतु संस्तुति सहित सेवा में प्रेषित है।


अधिशासी अभियन्ता
सिंचाई खण्ड बडौत
(बागपत)



भारतीय राष्ट्रीय राजमार्ग प्राधिकरण National Highways Authority of India

(सड़क परिवहन और राजमार्ग मंत्रालय)
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परियोजना क्रियान्वयन इकाई - बागपत
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प्रगति के पथ पर अग्रसर
BHARATMALA
ROAD TO PROSPERITY

NHAI/PIU-BPT/1012/Greenfield/2020/D- 6933

Date:- 20-09-2021

To,

The Divisional Forest Officer
Baghu road, Meerut Rd,
Near Sugar Mill, Baghpat, 250609

Sub: - "Development of 6 lane National Highway from the junction of Eastern Peripheral Expressway at Khekra to Saharanpur Bypass at Latifpur village from km 0.000 to km 118.533 of Delhi to Dehradun Economic Corridor under Bharatmala Pariyojana. Package-1 (km 0+000 to 27+000)" (online proposal no- FP/UP/ROAD/118170/2020.)

Ref: - (1) Our letter no. NHAI/PIU-BPT/1012/Greenfield/2021/D-6841 dated 8/9/2021
(2) EDS issued from MoEFCC, RO Lucknow vide letter no 8B/UP/06/193/2021/FC/ 277 dated 04/08/2021
(3) Letter no. 223/14-1 dated 12/08/2021, EDS from office of DFO, Baghpat.
(4) Letter no. 910/14-1 dated 17/09/2021 EDS from office of DFO, Baghpat

Sir

Please refer to the above captioned subject and aforementioned reference.

We herewith submit the compliance of above cited EDS under reference no.4 which is as follows.

S. No.	EDS issued from office of DFO Baghpat dated 17/09/2021	Compliance
1	Muck calculation sheet is not provided in Muck Disposal Plan.	<p>Construction package-I of this project road for which Forest Land Diversion Proposal is uploaded has a total length 27.000 km and it is a green field alignment having PRoW 70 meter and embankment height (in general) 2.00 to 2.5 meter located on plane terrain.</p> <p>Any hill cutting, tunnelling, deep excavation other than construction of cross drainage and bridges are NOT proposed and to raise the height of embankment additional earth material is required.</p> <p>Since, no muck is likely to be generated due to construction of project road, disposal of muck is not required.</p> <p>However, approx. 4,46,125.71 Cum of excavated ordinary earth is likely to be generated which will be reutilized in embankment of the project work.</p> <p>As compliance of EDS, detailed calculation sheet of excavated material and its utilization is attached with Disposal Plan (Annexure-7).</p>

Being a priority project, we request to you kindly accept and submit it for onwards early processing of forest land diversion proposal.

Thanking You

20.9.2021

Project Director
NHAI-PIU, Baghpat

Name of Project: - "Development of 6 lane National Highway from the junction of Eastern Peripheral Expressway at Khekra to Saharanpur Bypass at Latifpur village from km 0.000 to km 118.533 of Delhi to Dehradun Economic Corridor under Bharatmala Pariyojana. Package-1 (km 0+00 to 27+000)"

Introduction

The Muck often considered as waste material generated from tunnelling, cutting of hill, deep excavation etc. Based on the geological nature of the rocks and engineering properties of the soil, a part or full of the excavated material will be used as construction material/filling material in road work.

Construction package-I of this project road for which Forest Land Diversion Proposal is uploaded has a total length 27.000 km and it is a green field alignment having PRoW 70 meter and embankment height (in general) 2.00 to 2.5 meter located on plane terrain. Any cutting, tunnelling other than construction of cross drainage, bridges are NOT proposed and to raise the height of embankment additional earth material is required. Keeping in view of road work, small quantity of excavated material (ordinary earth) will be generated from foundation work of, bridges/ cross drainages as well as Clearing & Grabbing. Excavated material generated from these construction sites will be utilized in filling/raising of Embankment of project road.

Being a greenfield alignment, in this entire section of project road, NO muck will be generated and any disposal is not required as excavated ordinary earth material will be re-utilized in filling of embankment.

Component wise quantification of excavated material and it utilization

Excavated Material Generation			Utilization of excavated Material	
SL	Project Component	Excavated Material Generation Quantity (cum)	Project Component	Excavated Material - Utilization Quantity (cum)
1	Box Bridge	8,644.43	Embankment Quantity (Raising of Embankment upto FRL)	43,41,323.93
2	Minor Bridge	12,306.54	-	-
3	Cut & Cover Box	18,992.40	-	-
4	ROB	22,172.40	-	-
5	EUP	6,687.93	-	-
6	Pipe Culvert	1,142.32	-	-
7	Box Culvert	8,125.78	-	-
8	Box VUP	11,627.11	-	-
9	Miscellaneous ROAD work (Earthen Drain, Boundary Stone Fixing, Clearing & Grubbing)	3,56,426.80		
	Total	4,46,125.71		43,41,323.93

संजय कुमार मिश्रा/Sanjay Kumar
परियोजना निदेशक/Project Director
पी०आई०यू०-बागपत/P.I.U.-Baghpat

Balance Disposal (without factor)	Quantity (without swell factor)	for 4,46,125.71- 43,41,323.93= (-) 38,95,198.22 cum
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Total quantity of excavated material is 4,46,125.71 Cum.

Soil in project area i.e district Baghpat is of loamy textured soil which has swell factor 15-25 %)

Add Swell factor 20% (average) for Earth material

So, Bank material is $100\%/100 = 1$

Loose Material = Bank Material + Swell

Or

Loose = $1 + (20/100) = 1.20$

Total Material to be disposed/utilized considering swell factor = $4,46,125.71 \times 1.20 = 5,35,350.852$ Cum

Disposal/Utilization of Excavated Material

As detailed, above total quantity of excavated material is 4,46,125.71 cum (with Swell factor it will be 5,35,350.852) cum. However, ordinary earth material required for raising/filling of embankment is 43,41,323.93 cum, so remaining quantity of excavated material to be disposed off/utilized, will be

$4,46,125.71$ (generated quantity) - $43,41,323.93$ (required quantity) = (-) 38,95,198.22 cum

It means, filling quantity for raising of embankment is much more than quantity of excavated material and no separate disposal of these excavated material is required as all the excavated material will be re-utilized in project road for raising of embankment upto FRL.

SL	Particulars	Remarks
1	Calculation of muck to be generated. Swell factor to be applied.	Total quantity of excavated material 4,46,125.71 Cum. Soil in project area i.e district Baghpat is of loam textured soil which has swell factor 15-25 %) Add swell factor 20% (average) for Earth material So, Bank material is $100\%/100 = 1$ Loose Material = Bank Material + Swell Or Loose = $1 + (20/100) = 1.20$ Total excavated material considering swell factor = $4,46,125.71 \times 1.20 = 5,35,350.852$ Cum Note- Component wise quantification is given in above table.
2.	Quantity of muck to be utilized in the project activities	A total 4,46,125.71 Cum, excavated material will be generated and it will be fully utilized in project.
3.	Balance quantity of muck which requires disposal/ management plan.	No muck is generated so its disposal is not required. However, excavated material / ordinary earth will be generated which is detailed above. Total quantity of Excavated Material = 4,46,125.71 Cum. Total requirement of filling ordinary earth material - 43,41,323.93 Cum.

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परियोजना निदेशक/Project Director
पी०आई०यू०-वागपत/P.I.U.-Baghpat

		Balance quantity of muck for disposal= (-) 38,95,198.22 cum. That means disposal of excavated material is not required as utilization quantity is much more than generation quantity.
4	Carriage of muck from the muck generation site to the dumping site.	As per contract condition generated/excavated will be disposed by contractor at their own cost which is included in civil cost. Also, as stated above, the generated quantity of muck will be utilized in embankment of project road.
5.	Ownership of land and the consent of land owners in case muck disposal is proposed on non-forest land.	Excavated quantity will be utilized in Embankment of project road which is in jurisdiction & under control of NHAI-PIU Baghpat.
6	Photograph & carrying capacity of proposed dumping site (Muck disposal site)	Carrying capacity of proposed site is much more than required disposal quantity (4,46,125.71 Cum). Length of project road for which Forest Land Diversion Proposal is uploaded 27000-meter X width 70-meter X Average height 2.5 meter= Total capacity 47,25,000 Cum.
7	Development of dumping site- construction of retaining walls and other structure as per requirement of the site. The objective is to completely stop rolling down of the muck.	No dumping site required to be constructed for disposal of Excavated Material, as it will be re- utilized in embankment of project road.
8	Rehabilitation of dumping site like leveling, planting of grass, shrubs and tree species.	Not applicable, due to above mentioned reason in column no. 7.

Note: - Cost to be incurred on the above activities has to be given component wise. Details of dumping site including length, width and height of structures to be erected must be mentioned. - included under civil cost.

Undertaking by user agency has to be given to the effect that:

- 1. Muck management plan will be implemented by user agency and in case of non-implementation of plan; they will be liable to penalty / action at their cost- Agreed*
- 2. The proposed dumping site is located away from river/ stream/ Nala.-Yes*

Date:-

Place: - Baghpat

संजय कुमार मिश्रा/Sanjay Kumar Mishra
परियोजना निदेशक/Project Director
नई दिल्ली/नयागपत/P.I.U.-Baghpat
NHAI-PIU Baghpat
Uttar Pradesh
Name: - Sanjay Kumar Mishra

Signature & Seal

Annexure- III

AVENUE PLANTATION STRATEGY & GREEN BELT DEVELOPMENT PLAN

1. INTRODUCTION

Due to the proposed development, some of the existing trees are to be felled. To offset this impact, compensatory afforestation programme through tree plantation, median plantation, horticulture and landscaping strategy has been prepared, based upon the experiences of successful implementation of several ongoing and completed projects.

2. OBJECTIVE

The main objectives are as follows:

- Reducing the impacts of air pollution
- Natural noise barrier
- Arrest of land erosion
- Prevention of vehicle glare from vehicles coming from opposite direction
- Enhancement of aesthetic view of the corridors
- Climatic amelioration
- Defining of ROW especially at sharp curves during night

3. SPECIES SELECTION

Grasses, shrubs and trees are the main species that are readily available in India. Wherever possible, the use of non-native species should be avoided since they can out compete and displace native plants leading to loss of native biodiversity. To maximise the chances of success of survival of species, selection of species shall be done according to environmental conditions of the project site. Care should also be taken to select species with root systems that match the nature of the soil movement at the project site. Homogenous avenues of trees should be selected for long stretches as it provides aesthetic qualities in the landscaping. One should also consider the economic and other social benefits while selecting the species for plantation. During the selection of species, preference should be given towards rapid growing, pollution tolerant and pest & disease resistant species. Shrub species, which are dwarf and pollution tolerant, are to be planted in the median to prevent the glare of traffic moving in opposite direction. However, the selection of species will finally be decided and approved by Supervision Consultant with recommendation from local forest department. In all highway project IRC:SP:21 :2009 is guiding document and plantation will be done accordingly , unless forest department recommend some different species.

Table 1: Suggested Trees and Shrub Species (As per IRC: SP:21:2009)

S.No.	Botanical Name	Common Name	Remarks
A. Trees			
1	<i>Albizzia lebbbeck</i>	Siris	
2	<i>Albizzia procera</i>	Safed Siris	
3	<i>Butea monosperma</i>	Palash	
4	<i>Bauhinia variegata</i>	Kachnar (Pink)	
5	<i>Cassia fistula</i>	Laburnum/Amaltash	
6	<i>Cassia siamea</i>	Siamese Cassia	
7	<i>Cedrela toona</i>	Toon	
8	<i>Chikrassia tabularis</i>	Chikasi	
9	<i>Calistemon lanceolatus</i>	Bottle Brush	
10	<i>Dalbergia sissoo</i>	Sheesham	
11	<i>Emblica officinalis</i>	Aonla	
12	<i>Ficus sp.</i>	Peepal, Bagad, Pakur etc.	Not suggested along this highway because of large canopy size
13	<i>Gravellea robusta</i>	Silver oak	
14	<i>Hardwickia pinnata</i>	Malabar Mahagani	
15	<i>Lagerstroemia thorli</i>	Pride of India/Jarul	
16	<i>Lagerstroemia floriginea</i>	----do----	
17	<i>Morus alba</i>	Shahtoot	
18	<i>Mangifera indica</i>	Shahtoot	


 08.09.2021
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S.No.	Botanical Name	Common Name	Remarks
19	<i>Pterospermum acerifolium</i>	Kanak Champa	
20	<i>Putranjiva</i>		
21	<i>Polyalthea longifolia</i>	Ashok	
22	<i>Syzigium cumini</i>	Jamoon	
23	<i>Terminalia arjuna</i>	Arjun	
24	<i>Terminalia belerica</i>	Bahera	
25	<i>Terminalia chebula</i>	Harr/Myrobalam	
26	<i>Tecoma argentia</i>		
B. Shrubs			
1	<i>Bauhinia alba</i>		
2	<i>Bauhinia acuminata</i>		
3	<i>Bougainvillia</i>	Garden glory	
4	<i>Cassia biflora</i>		
5	<i>Cassia alata</i>		
6	<i>Cassia lavigata</i>		
7	<i>Calliandra</i>		
8	<i>Duranta</i>		
9	<i>Gardenia floria</i>		
10	<i>Hamelia</i>		
11	<i>Hibiscus sps.</i>		
12	<i>Ixora</i>		
13	<i>Nerium oleander</i>	Kaner	
14	<i>Thevetia nerifolia</i>	Yellow Kaner	Not suggested as this species is banned by NHAI
15	<i>Tecoma stans</i>		
16	TMS single and double		

(Source: IRC: SP-21, 2009)

Table 2: Identified Area and Type of Plantation for proposed

S. No.	Plantation type	Location	Description
1	Avenue	Available Open land within RoW road	Approx. 50,000 nos. of avenue trees to be planted within the available RoW both side of project road as per IRC: SP: 21- 2009 preferably native plant species.
2	Avenue	Between km 0+00 to 27+00	Approx 6500 tree. Plant to plant distance 10 meter 2 rows each side of project road in a plantable length approx. 26 km.
2	Landscaping	All Service areas/ interchanges/ O&M centres / Toll booths	Ornamental type plantation shall be provided
3	Shrubs	In median except structure	Ornamental type plantation shall be provided

4 TASKS OF THE CONTRACTOR/CONCESSIONAIRE

As part of this project implementation, the contractor/concessionaire shall plant and maintain flowering, shade, medicinal, ornamental & fruit bearing trees in suitable area for which cost has been budgeted besides planting and maintenance of ornamental, medicinal & flowering plants and shrubs in the median for which cost has also been budgeted. The specific roles and responsibilities of the Contractor/Concessionaire include:

- Identification of the plantation stretches with NHAI and / or Consultant.
- Identification of nursery area and preparation of nurseries
- Planting of saplings in the nurseries during the construction period so that the saplings are a minimum 24 months old having height more than 1.5 m
- Replantation of the 2-year-old saplings to the plantation stretches and
- Maintenance for three years including watering, removal of weed, litter and debris from the vicinity of the plantation.

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- Ensure the protection of the tree guards provided to the saplings from trampling and browsing by the cattle.

5. GUIDELINES FOR HORTICULTURE PLANTATION AND LANDSCAPING

5.1. General

5.1.1. Scope

Contractor/Consultant to furnish all materials, labour and related items necessary to complete the work indicated on drawing and specified herein.

5.1.2. Materials

Plant Materials

- Plant Materials shall be well formed and shaped true to type, and free from disease, insects and defects such as knots, sun-scaled, windburn, injuries, abrasion or disfigurement.
- All plant materials shall be healthy, sound, vigorous, free from plant diseases, insects, pests of their eggs, and shall have healthy, well-developed root systems. All plants shall be hardy under climatic conditions like native species of the project area. Plants supplied shall conform to the names listed on the plant list provided above. Besides these plant species, the Contractor/Concessionaire shall supply other species as desired by the landscaping specialist and or the environmental specialist of the consultant. Under no circumstances, non-native species which might have a negative impact on the ecology of the area shall be permitted. No plant material will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.
- Any nursery stock shall have been inspected and approved by the Environmental Specialist of the Consultant.
- All plants shall conform to the requirements specified in the plant list. Except that plants larger than specified may be used if approved but use of such plants shall not increase the contract price. If the use of the larger plant is approved, the spread of roots or ball of earth shall be increased in proportion to the size of plant. Deliver plants with legible identification labels.

Topsoil (Good Earth)

- Topsoil or good earth shall be a friable loam, typical of cultivated topsoil of the locality containing at least 2% of decayed organic matter (humus). It shall be taken from a well-drained arable site. It shall be free of subsoil, stones, earth skids, sticks, roots or any other objectionable extraneous matter or debris. It shall contain no toxic material. No topsoil shall be delivered in a muddy condition. It shall have pH value ranging in between 6 to 8.5.

Fertiliser

Measurement of sludge shall be in stacks, with 8% reduction for payment. It shall be free from extraneous matter, harmful bacteria, insects or chemicals (Subjected to safety norms).

5.1.3. Condition: Trees and shrubs shall be substantially free from pests, diseases and shall be materially undamaged. Torn or lacerated roots shall be pruned before dispatch. No roots shall be subjected to adverse conditions such as prolonged exposure to drying winds or subjection to water logging between lifting and delivery.

5.1.4. Supply and Substitution: Upon submission of evidence that certain materials excluding the plant Species prescribed are not available at time of contract, the Contractor/Concessionaire shall be permitted to substitute with an equitable adjustment of price. All substitutions shall be of the nearest equivalent species and variety to the original specified and shall be subjected to the approval of the Environmental Specialist of the Consultant.

5.1.5. Packaging: Packaging shall be adequate for the protection of the plants to avoid heating or drying out.

5.1.6. Marking

- Its name
- The name of the supplier, unless otherwise agreed.
- The date of dispatch from the nursery.

5.2. Plantation Pattern

The type of plantation would be based upon the requirements and the feasibility of the sites along the project corridor. The availability of the space in the RoW is a major guiding factor for landscaping. The plantation pattern to be followed is:

- The first row of plants along the highways will be of small to medium height plants planted at a spacing of 2m c/c and the distance from the second row should be 3m. The second row should be in staggered. The distance from the toe of the embankment should be 1m minimum and the height should be between 2m to 3m.
- Flowering shrubs shall be planted in the median in rows as per width availability. Where the width is less than 1m, grass turving is to be done. One row of plantation to be done at a spacing of 1 m c/c.

For special landscaping, embankment slopes and ground cover, herbaceous species to be used. Turfing to be done by grass.

5.3. Tree Planting

5.3.1. Plants and Shrubs

Trees should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed back to back and the ball covered with sand to prevent drying out. Bare rooted plants can be heeled in by placing the roots in prepared trench and covering them with earth, which should be watered

into, avoid air pockets round the roots and shrubs shall be planted with the approval of Environmental Specialist of Consultant.

5.3.2. Digging of Pits : Tree pits shall be dug a minimum of three weeks prior to backfilling. The pits shall be 120cms in diameter and 120cms deep. While digging the pits, the topsoil up to a depth of 30cms may be kept aside, if found good (depending upon site conditions), and mixed with the rest of the soil.

The side of the pit shall be replaced with the soil mixture as specified further herein. If the soil is normal it shall be mixed with manure; river sand shall be added to the soil if it is heavy. The bottom of the pit shall be forked to break up the subsoil.

5.3.3. Back Filling

The soil for backfilling shall be watered thoroughly and gently pressed down, a day before planting, to make sure that it may not further settle down after planting. The soil shall be pressed down firmly by treading it down, leaving a shallow depression all-round for watering.

5.3.4. Planting:

No tree pits shall be dug until final tree position has been pegged out for approval. Care shall be taken that the plant sapling when planted is not buried deeper than in the nursery, or in the pot. Planting should not be carried out in waterlogged soil. Plant trees at the original soil depth; soil marks on the stem is an indication of this and should be maintained on the finished level, allowing for setting of the soil after planting. All plastic and other imperishable containers should be removed before planting. Any broken or damaged roots should be cut back for sound growth.

The bottom of the planting pit should be covered with 50mm to 75mm of soil. Bare roots should be spread evenly in the planting pit; and small mound in the centre of the pits on which the roots are placed will aid on even spread. Soil should be placed around the roots, gently shaking the tree to allow the soil particles to shift into the root system to ensure close contact with all roots and prevent air pockets. Back filled soil should be firmed as filling proceeds, layer by layer, care being taken to avoid damaging the roots. The balance earth shall be filled in a mixture of 1:3 (1-part sludge to 3-part earth by volume) and 50gms potash, 50gms of Super Phosphate and 1 Kg. Neem oil cake. Aldrin or equivalent shall be applied every 15 days in a mixture of 5ml in 5 litres of water.

5.3.5. Staking

Newly planted trees must be held firmly although not rigidly by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.

The main methods of staking shall be:

- A single vertical stake, 900mm longer than the clear stem of the tree, driven 600mm to 900mm into the soil.
- Two stakes as above driven firmly on either side of the tree with a cross bar to which the stem is attached. It is suitable for bare-rooted or ball material.
- A single stake driven in at an angle at 45 degrees and leaning towards the prevailing wind, the stem just below the lowest branch being attached to the stake. Suitable for small bare-rooted or ball material.
- For plant material 3m to 4.5m high with a single stem, a three-wire adjustable guy system may be used in exposed situations.

The end of stake should be pointed and the lower part up to 1 m to 1.2 m should be coated with a non-injurious wood preservative allowing at least 150mm above ground level.

5.3.6. Tying

Each tree should be firmly secured to the stake to prevent excessive movement. Abrasion must be avoided by using a buffer, rubber or Hessian, between the tree and stake. The tree should be secured at a point just below its lowest branch, and just above ground level: normally two ties should be used for tree. These should be adjusted or replaced to allow for growth.

5.3.7. Watering

The Contractor/Concessionaire through the Landscape Contractor should allow for the adequate watering of all newly planted trees and shrubs immediately after planting and he shall during the growing season, keep the plant material well-watered

5.3.8. Fertilising

Fertilising shall be carried out by application of rotation of the following fertilisers, every 15 days from the beginning of the monsoon till the end of winter:

- Sludge or organic well-rotted dry farmyard manure: 0.05 cum or tussle.
- Urea 25gm.
- Ammonium sulphate 25gm.
- Potassium sulphate 25gm.

All shrubs, which are supplied pot grown, shall be well soaked prior to planting. Watering in and subsequent frequent watering of summer planted container-grown plants is essential.

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20.9.2021
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The activities are listed in table below-

Table 3: Activities Schedule for Avenue Plantation/Median Plantation

Year	Month	Activities to be done	
1 st Year	January-March	1	Surveying & cleaning of the area
		2	Digging of Pits
		3	Procurement of Angles Iron and barbed wire (or other fencing material), an erecting the fence
	April-June	1	Purchase of Farm yard manure
		2	Brick/iron etc. guard for 1sr row will not be required as the highway is access controlled and fencing will be done
		3	Planation along the highway
		4	Filing up of Pits with Farm Yard manure and Soil
2 nd Year	July-August	1	Transportation of Plants
		2	Planting of Saplings
		3	Watering
		4	Weeding and hoeing
		1	Weeding and hoeing
	September-November	2	Watering 4 times a month
	December-February	1	Weeding and hoeing
		2	Maintenance
	March	1	Watering 4 times a month
	April-June	1	Watering 6 times a month
		1	Casualty Replacement (20% of the total plants)
	July-August	2	Weeding
3 rd Year		3	Maintenance by Mali
	September-November	1	Watering 2 times a month
		2	Maintenance by Mali
	Dec.-Feb.	1	Maintenance by Mali
		1	Watering 4 times a month
	March	2	Maintenance by Mali
4 th Year		1	Watering
	April-March	2	Casualty Replacement (10% of the total plants)
		3	Maintenance by Mali
5 th Year		1	Watering
	April-March	2	Casualty Replacement (5% of the total plants)
		3	Maintenance by Mali

Table 4: Proposed Monitoring Arrangement

Phase	Monitoring Parameter	Monitoring by	Release of Payment
1 st Year (Advance Soil Work)	No. of Pits	Environmental Manager, Environmental Officer of Supervision Consultant Representative of Forest Deptt.	December-40% of the total amount
2 nd Year (Plantation of Saplings)	Survival % of saplings	Environmental Manager, Environmental Officer of Supervision Consultant Representative of Forest Deptt.	April-20% of the total amount
3 rd Year (Maintenance of Plantation)	Survival % before & after Casualty Replacement	Environmental Manager, Environmental Officer of Supervision Consultant Representative of Forest Deptt.	April-20% of the total amount
4 th Year (Maintenance of Plantation)	Survival % before & after Casualty Replacement	Environmental Manager, Environmental Officer of Supervision Consultant Representative of Forest Deptt.	April-10% of the total amount
5 th Year (Maintenance of Plantation)	Survival % before & after Casualty Replacement	Environmental Manager, Environmental Officer of Supervision Consultant Representative of Forest Deptt.	April-10% of the total amount


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Phase	Monitoring Parameter	Monitoring by	Release of Payment
Plantation)	Casualty Replacement	Officer of Supervision Consultant Representative of Forest Deptt.	amount

6. SPECIAL CONDITIONS AND PARTICULAR SPECIFICATIONS.

- Wherever applicable, work shall be done according to specifications in vogue, at the time of invitation of tender.
- The Plantation area should avoid the stretches within the settlement area and the Ecological Sensitive area.
- The stretches identified should be free from encumbrances and should not lead to impact on any private or community asset. No fresh land acquisition shall be made under the project for the purpose of plantation.
- Contractor/Concessionaire through the Landscaping Contractor shall make his own arrangement for water.
- The work included in the schedule of Quantities includes grassing as well as planting of trees and shrubs. The quoted rates shall include execution of these works at different levels and nothing extra shall be paid for any item, for working at these levels
- The Landscaping Contractor shall not be entitled to any compensation for any losses suffered by him and/or revision in the rates originally quoted by him. (a) On account unforeseen delay in commencing the work, irrespective of the cause of such delays. (b) On account of reduction in the scope of work. (c) On account of suspension of work or abandon after award of work.
- The Contractor/Concessionaire shall provide all facilities to Environmental Specialist / Project Engineer and / or his authorized representatives to make frequent inspection of their Nursery and ascertain the process / quality of various categories of trees / plants etc., grown by them.
- The quote rate shall include the cost of transportation of tools and plants to and from the site, including GST. It shall be clearly understood that no claim for any extra payment on account of GST shall be entertained after the opening of the tender.
- The safe custody and up-keep of various categories of plants brought to the site is the sole responsibility of the Contractor/Concessionaire and he shall employ enough supervisory personnel to ensure the safety of these items. The site of work may be handed over to the Contractor/Concessionaire in phases, as soon as the same are available and the Contractor/Concessionaire in turn shall work in these areas forthwith. Nothing extra shall be payable for such phased execution of work. While excavating / executing the work the Contractor/Concessionaire shall ensure that the existing cables / pipelines / structures / fittings are not damaged and if due to his negligence, these are damaged, the same shall be set right with no extra cost to the clients.
- The Contractor/Concessionaire shall co-ordinate his work with other agencies employed by the Clients and ensure that the works of other agencies are not hampered in any way during the duration of contract.
- The Contractor/Concessionaire shall keep the sites neat and clean during the execution of the work. Any debris found at or near the site of work shall be moved immediately as and when so required by the Environmental Specialist / Project Engineer.
- On completion of the work, the site of work shall be thoroughly cleaned, and all debris shall be removed before the work is handed over satisfactorily.
- The Contractor/Concessionaire shall, without any additional charge to the clients, renew or replace any dead or defective plants/grass for a period of 12 months after the certified date of completion.
- "General condition of contract and standard contract forms shall also be the part of the contract.
 - All Tree saplings should be two years (2) years old before they are planted. The numbers of the plants shall be as specified in the schedule of quantities and shall be straight and symmetrical with a crown and having a persistent main stem. The size of crown shall be in good overall proportion to the height of the tree.
 - Small trees and shrubs shall be well formed with the crown typical of the species or variety.

General requirements of plants

Plants shall be typical of their species and variety, well-developed branches, and well foliated with fibrous root system. Plants shall be free from defects and injuries. Plants shall not be pruned before planting.

- ❖ Plants shall be free from defects and injuries.
- ❖ Plants shall not be freshly dug, and nursery grown.
- ❖ Nursery grown plants shall have been at least once transplanted

- Bark shall be free from abrasion.
All trees, soon after planting, shall be properly supported with bamboo stocks to ensure their safety against winds or any other factor, which may affect it adversely.

Protection of "tree to be preserved"

The Contractor/Concessionaire through the Landscaping Contractor shall be responsible for the protection of tops, trunks and roots of existing trees on site. Existing trees subject to the construction damage shall be boxed, fenced or otherwise protected before any work is started. Total 2374 Nos. of existing trees will be protected as it is in situ.

General Requirements of Earth Manure and Fertilisers

EARTH: Good earth shall be agricultural soil of loamy texture, free from kankar, murram, shingles, rocks, stones, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 50mm in any direction. It shall have pH ranging in between 6.5 to 7.5.

- **MANURE:** Manure shall be of well-decayed organic matter obtained in dry state from the Municipal dump or other similar source approved by the Environmental Engineer/ Project Engineer. The manure shall be free from earth, stone or other extraneous matter. Manure shall be supplied at site well screened.
- **FERTILISER:** If the soil tests indicate pH value not as per the above specification namely in between 6.5 to 7.5, following measures need to be taken.
- If pH exceeds 7.5, aluminium sulphate or equivalent fertilizer should be added at the rate of 1 kg per cubic metre to lower the pH by one full point.
- If pH is below 6.5, add ground limestone or equivalent fertilizer at the rate of 1 kg per cubic metre to raise pH by one full point.

7. TEAM FOR THE ASSIGNMENT

The Contractor/Concessionaire is free to recommend a team commensurate with the requirements of the project.

8. DATA TO BE PROVIDED BY THE CLIENT

Client will provide to the Contractor/Concessionaire the map showing settlements and the forest areas.

9. RECOMONDATIONS

Due care should be taken to ensure that a greenbelt is developed around the plant. All areas devoid of vegetation and having low density should be systematically and scientifically afforested. Greenbelt will be a set of rows of trees planted such a way that they form an effective barrier between the plant and the surroundings. The persistence of green belt development is to contribute to the following factors:

- To attenuate noise levels generated from the plant;
- To improve the aesthetics of the plant area;
- To trap the vehicular emissions and fugitive dust emissions;
- To maintain ecological homeostasis;
- To prevent soil erosion and to protect the natural vegetation;
- To utilize the treated effluents.

The plantation species should be considered based on the following:

- Adapted to the Geo-climatic conditions of the area;
- Mix of round, spreading, oblong and conical canopies;
- Different heights ranging from 4 m to 20 m.
- Tolerance to specific conditions or alternatively wide adaptability to Eco physiological conditions;
- Rapid growth;
- Capacity to endure water stress and climate extremes after initial establishment;
- Differences in height and growth habits;
- Pleasing appearances;
- Providing shade.

For the Calculation of Cost for Green belt Development, following parameters has been considered.

For Capital Cost

- a) Cost of Sapling (Trees)
- b) Shrub/Herbs
- c) Transportation Charges
- d) Planting cost (Including soil workings, pits etc.)
- e) Fencing Cost

For Recurring Cost:

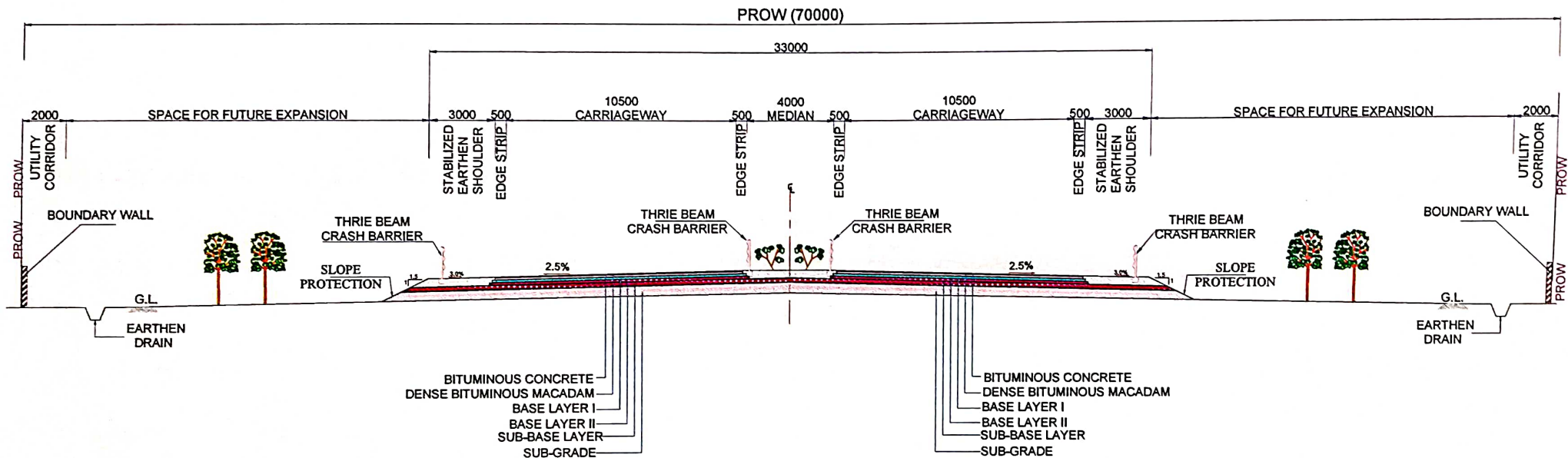
- a) Cost of drip irrigation
- b) Annual weeding and soil working
- c) Req. of water for irrigation

- d) Fertilization Cost
- c) Req. of water for irrigation
- d) Fertilization Cost
- e) Security and Vigilance

10. CONCLUSION

The tree species has been recommended as per soil quality and climatic conditions of the area. Year wise plan has been prepared for tree plantation on entire length of highway. Total 50,000 avenue trees will be planted and for its development.

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TCS-2
TYPICAL CROSS SECTION 6 LANE DIVIDED HIGHWAY WITHOUT EARTHEN SHOULDER

8/1/21
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CLIENT:

National Highways Authority of India
 (Ministry of Shipping, Road, Transport, Highways)
 Government of India p-5 & 6, Sector - 10, Dwarka
 New Delhi - 110075



SCALE :

HORIZONTAL SCALE 1 : 2000
 0 20 40 60 80 100m
 VERTICAL SCALE 1 : 200
 0 2 4 6 8 10m

CONSULTANT:



M/s MSV INTERNATIONAL INC.
 In Association With
MSV INTERNATIONAL TECH PVT. LTD.
 Unit no-514, 515 and 516, 5th floor, Sunray Success Tower, Golf
 Course, Extension Road, Sec-05, Gurgaon-122005

NAME OF PROJECT:

Development of six lane access control greenfield highway of Delhi-Saharanpur-Dehradun
 economic corridor under Bharatmala Pariyojana from Junction of EPE (VIII-Mavikalan) Design
 Chainage 0+000 to Design Chainage 27+000 (VIII-Lohadda) in the state of Uttar Pradesh on
 EPC Mode (Package-I).

DRAWING TITLE:

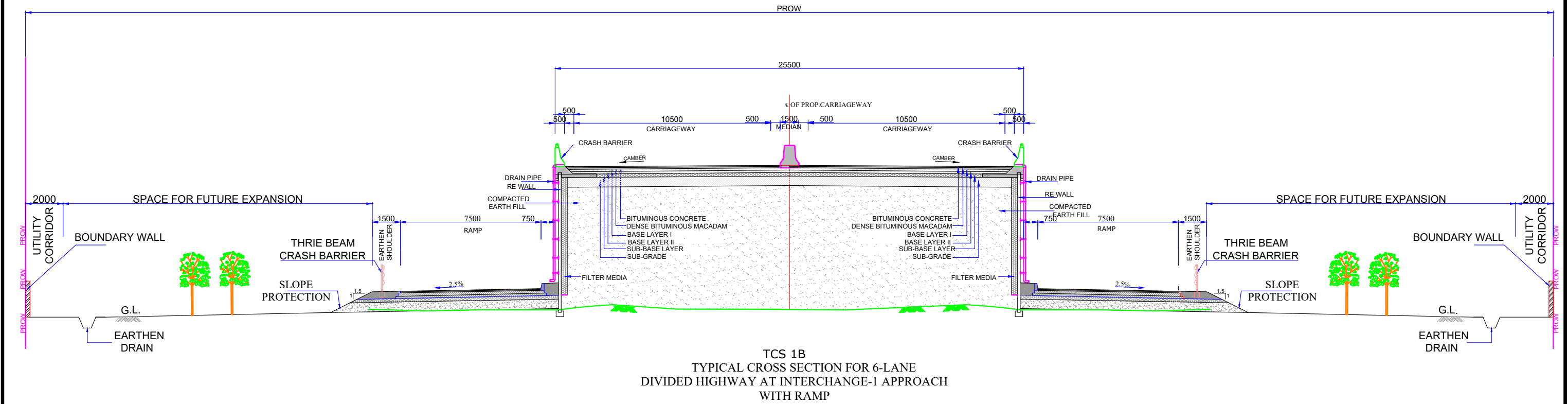
TYPICAL CROSS SECTION

DRAWING NUMBER - NH/MSV/ECB/HP/DEL-DEHPKG-SLA-76/PTCS-02

DRAWN	DESIGNED	CHECKED	APPROVED
KAPIL	G.C.M.	ASIF	S.S.

SCALE:
 H = 1:2000
 V = 1:200

DATE:
 Feb-2021
 REV.



CLIENT:

National Highways Authority of India
(Ministry of Shipping, Road, Transport & Highways)
Government of India g - 5 & 6, Sector - 10, Dwarka
, New DELHI - 110075



SCALE :

HORIZONTAL SCALE 1 : 2000
0 20 40 60 80 100m
VERTICAL SCALE 1 : 200
0 2 4 6 8 10m

CONSULTANT:



M/s MSV INTERNATIONAL INC.
In Association With
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Unit no-514,515 and 516, 5th floor, Suncliff Success Tower, Golf
Course, Extension Road, Sec-65, Gurgaon-122005

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Chainage 0+000 to Design Chainage 27+000 (Vill-Lohadda) in the state of Uttar Pradesh on
EPC Mode (Package-I).

DRAWING TITLE:

TYPICAL CROSS SECTION

SCALE:
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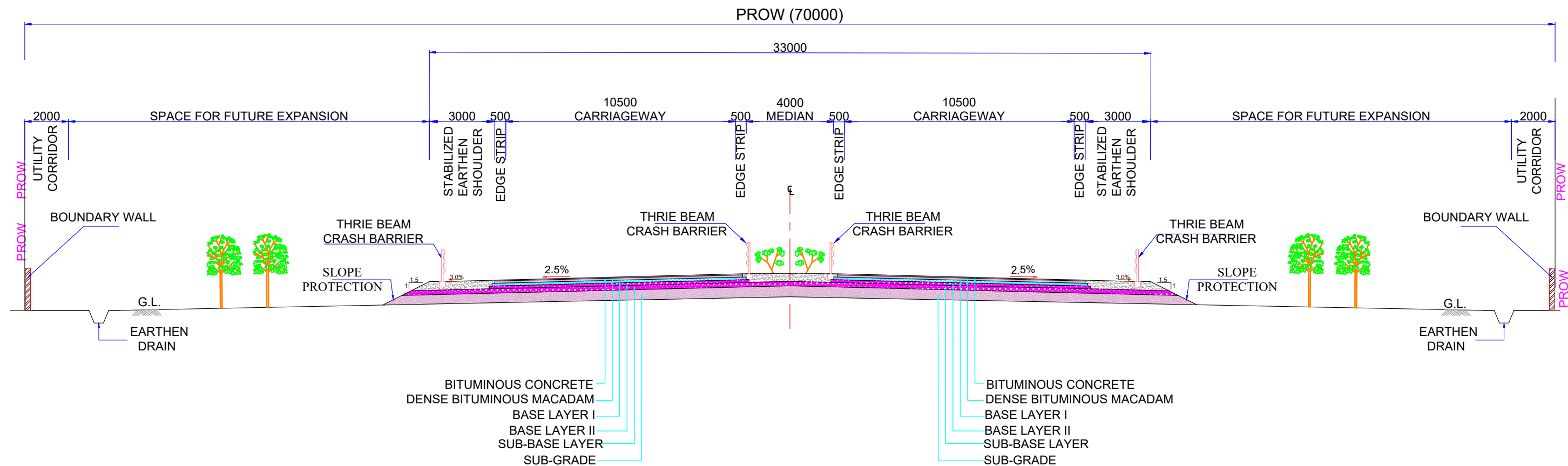
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DATE:

Feb.-2021

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KAPIL	G.C.M	ASIF	S.S

REV.



CLIENT:

National Highways Authority of India
(Ministry of Shipping, Road, Transport & Highways)
Government of India - 5 & 6, Sector - 10, Dwarka
New DELHI - 110075



SCALE :

HORIZONTAL SCALE 1 : 2000
0 20 40 60 80 100m
VERTICAL SCALE 1 : 200
0 2 4 6 8 10m

CONSULTANT:



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TYPICAL CROSS SECTION

DRAWING NUMBER:- NHAI/MSV/EC/BHP/DEL-DEH/PKG-5/Lot-7/SP/TCS-02

DRAWN	DESIGNED	CHECKED	APPROVED
KAPIL	G.C.M	ASIF	S.S

SCALE:
H = 1:2000
V = 1:200

DATE:

Feb.-2021

REV.