HARYANA
pwd
BUILDINGS & ROADS

Haryana PWD (B&R)
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To

Deputy Conservator of Forests
Gurugram

Memo No. 96478 Dated. 25.06.2024

Subject: - Diversion of 9.7884 ha.(7.5146 ha. in Gurugram) forest land for construction of new road Realignment of Rewari Sohna Palwal road NH 919 Old NH 71B from km 47.100 to 49.350 in Sohna Hilly Portion on EPC mode under Forest Division & District in Gurugram & Mewat, Haryana.(Online proposal no. FP/HR/ROAD/155111/2022)- regarding.

It is informed that the observations were raised on Parivesh portal w.r.t. Forest proposal cited in subject and pointwise reply of the same are as follows: -

Sr. No.	Observation	Reply
(i)	The road proposed under the instant proposal is new alignment, accordingly details of the alternate alignments along with justification of selecting proposed alignment and reasons for discarding others. The KML file of all alternatives need to be submitted.	Alternative alignment report prepared by the consultant is enclosed herewith and justification of selecting proposed alignment and reasons for discarding others have been explained in the report. It is also highlighted that the proposed alignment has been approved by competent authority of Ministry of Road Transport and Highways after examination of alternatives in detail. KML file of all alternatives has also been uploaded on Parivesh Portal for reference.
(ii)	Land suitability certificate with respect to the land identified for raising CA does not include specific details of the land parcel proposed for raising CA. Further, for less than 5 hectares patch the DFO needs to certify that the same is in continuity of the forest land.	Reply w.r.t. this point is to be given by Forest Department.
(iii)	Cross section map and layout plan of proposed RoW needs to be submitted.	Cross section map and layout plan of proposed RoW is enclosed.
(iv)	Examination of the proposed alignment over google satellite imaginary revealed that proposed alignment is passing through barren ghats, accordingly there is probability of the soil erosion during construction period. The specific comments from the DFO concern along with comprehensive soil conservation measures	Report on this issue was sought from DPR consultant and copy of report is enclosed. According to the report, Soil erosion during construction period is not likely to happen on account of the stability of slopes discovered during investigation carried out in the study conducted by him.
(v)	The CA Scheme uploaded mentions about provisions of FC Rules, 2003 and 2022. The CA scheme may be revised by deleting all details regarding FC Rules, 2003/2022 and only details of Van(Sanrakshan Evam Samvardhan) Rules, 2023 shall be quoted under which the instant land as CA is being proposed.	Reply w.r.t. this point is to be given by Forest Department.
(vi)	The CA land proposed under village 'Sehjawas' have been shown in two parts in KML file: a) 382 sqm. and b) 2.43 ha., DFO is required to clarify how the land of 382 sqm. shall be protected and as per CA provision any isolated patch of CA land less than 5 ha is not accepted as per 2.2 (xi) of the Consolidated Guidelines and	It is informed that Gram Panchayats of Sehjawas and Mandawar village have offered their land for compensatory afforestation. The offered land has been utilized for instant proposal and following four separate forest proposals: i) FP/HR/ROAD/416056/2023 ii) FP/HR/ROAD/416065/2023 iii) FP/HR/ROAD/418278/2023 iv) FP/HR/ROAD/418165/2023

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	Clarifications on Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 and Van (Sanrakshan Evam Samvardhan) Rules, 2023. Hence, the proposed CA land may be reviewed in view of the provisions of FC Rules, 2023.	The entire land proposed for all the above said proposals has been marked in separate KML file and the same has been uploaded on Parivesh Portal. Therefore, the isolated patch is not actually isolated but contiguous to other forest land. Accordingly, it is requested that the land proposed for instant case may be accepted for compensatory afforestation. It is also informed that the land being offered for compensatory afforestation is proposed under Rule 13(3) (d) of the Van (Sanrakshan Evam Samvardhan) Rules 2023 and the same is reproduced as follows:- "**13.3 (d)** ***lands falling under section 4 and 5 of the Punjab Land Preservation Act, 1990 in the State of Haryana, Punjab and Himachal Pradesh, which are not under the management and administrative control of the State Forest Department, provided that such lands will be transferred and mutated in the name of State Forest Department, unless as specified and agreed to by the Central Government to notify them under Indian Forest Act 1927 (16 of 1927), without transferring them to the State Forest Department, on case to case basis.*** The rule makes provision for exemption of mutation if agreed by Central Government. It is proposed that approval of Central Government for exemption to mutate the land ownership may be obtained in the instant case on following premises. a) The land proposed for compensatory afforestation is under the ownership of Panchayat and transfer of Panchayat land is governed under the Punjab village Common lands (Regulation) Rules 1964 which requires Panchayat resolution for transfer. At present, the Panchayat has only given resolution for giving possession of land to Forest Department for raising compensatory afforestation. Accordingly, Central Government may give exemption for mutation in order to respect the decision of Panchayat/local government to retain ownership of land. b) The land offered is Panchayat land and therefore, Forest Department will not face any problem in raising compensatory afforestation since Panchayat land is as good as Government land and it is governed by laws made by Govt. for Panchayats. c) The land offered for compensatory afforestation is a contiguous land parcel and raising compensatory afforestation will greatly help in increasing green cover and forest density in the state. The proposed parcel of land will be left barren if not notified as protected Forest land.

DA/As above

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Alternative Analysis and Justification for Locating the Sohna Realignment

1.1 Project Backgound

The project road starts from km 0+200 of NH-919 (Km 78.940 of old NH-71B) in Palwal and ends at km 52+450 (km 26.650 of old NH-71B) at Rajasthan Haryana border near Bhiwadi. Km 0+000 of NH-919 is at Agra Chowk, Palwal where the project road meets with NH-2. Project also includes the Realignment of existing road from km 47.100 to km 49.350 of old NH-71B near Sohna.

1.2 Need for Sohna Realignment

NH-71 B passes through hilly terrain near Sohna from km 47.100 to km 49.350. The width of existing road in this section is varying from 5.5m to 7m. Gradient on existing road goes up to 7% at few places. Traffic is more than 17000 PCU on this section of road. As there is mining area and crusher zone in the vicinity of the project road, mostly multi-axle trucks are running on the project road. Traffic Jams on this section of road is very common. Hence there is an urgent need of realignment of this section of road.

1.3 Option Study for Sohna Realignment

Consultant has done the option study for Sohna Realignment. 3 options were studied. Start point of Realignment is on Alwar Gurgoan Road (New NH 248A, 500 m away from Sohna 4 legged Intersection)) & end point is on km 47of NH71B. Length of the option-1 is 2.18 km, length of option-2 is 1.39 km and length of the option -3 is 1.12 kms. Detailed comparison is given in table 2. For details please the refer fig:1 on next page.

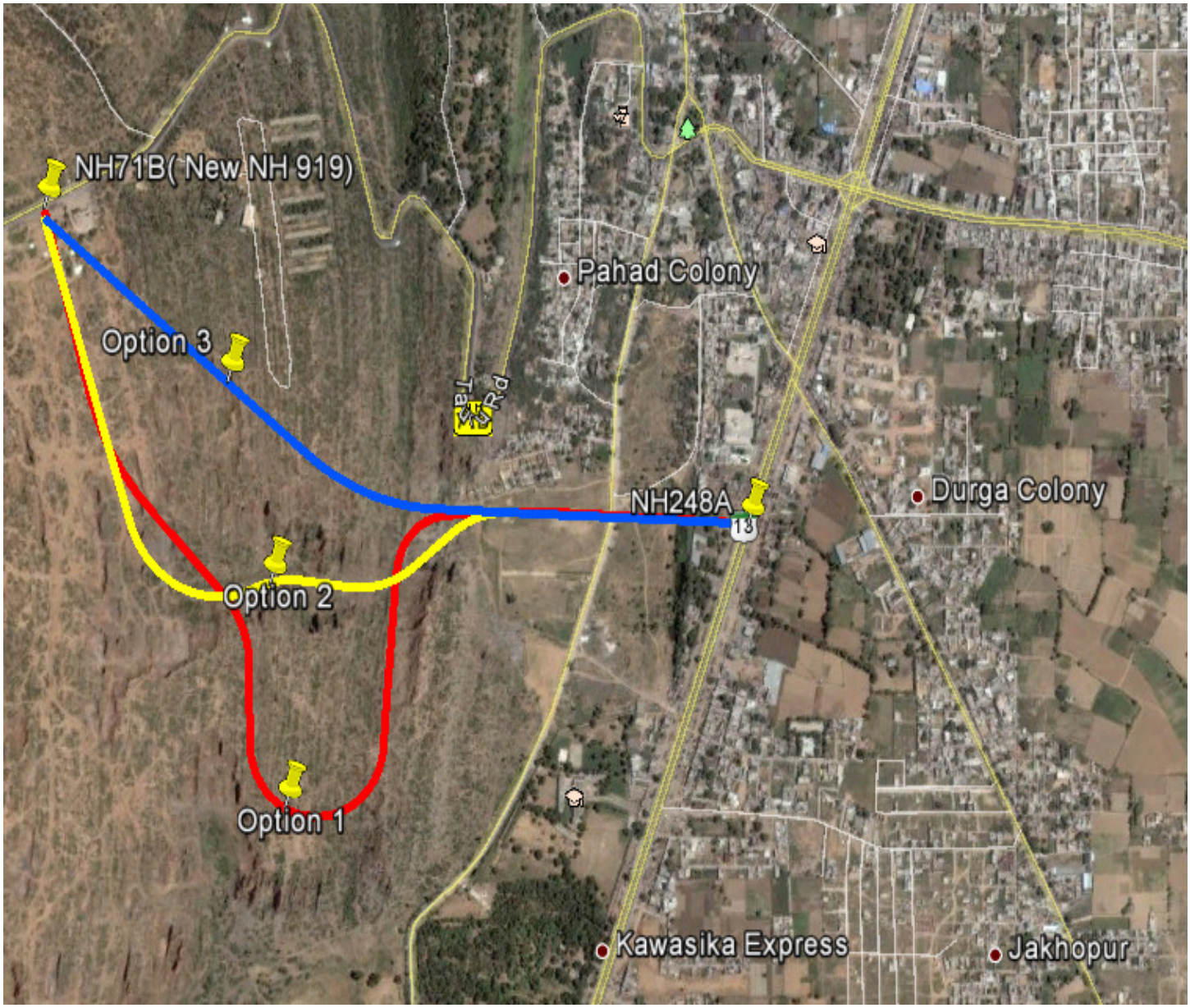


Fig 1. Option Study for Sohna Realignment

1.4 Mathematical Model Evaluation of Options

The comparative evaluation to select the final alignment is based on technical suitability, traffic needs, operating benefits and logical analysis. The study and analysis takes care of traffic and engineering aspects as well. Traffic benefits evaluation has been made on the basis of vehicle kilometre usage and logical analysis is on the basis of Consultant's experience on similar type of works. As discussed in last paragraph, preliminary selection was made for a total of 3 nos of alignments.

After site investigation an attempt has been made to identify the various important factors, which influence the judgement and selection of alignment for a new route. These factors are then examined for their relative level of influence, and marks assigned to each factor to indicate their relative weightage in the selection of alignment. The sum of all these marks is 100. Thereafter a marking system has been devised. Full marks are allotted to the best condition under each factor. Thereafter each deficiency is weighted and corresponding reduced mark assigned to it. The summation of marks so obtained for various factors determines the final score of the alignment. The marks obtained by the alignments serve as indicators of their relative level of suitability.

The ROW width required for widening of existing road is about 30 m. For construction of new bypass alignment, the required ROW is varying from 45 m to 60 m depending on the embankment height.

The factors influencing selection of alignment on each corridor have been identified for allocation of marks.

1. *Length of Proposed Road*
2. *Design Standards*
3. *Structures*
4. *Traffic Dispersal*
5. *Environmental Constraint*
6. *Land Acquisition & Social Impact*
7. *Cost*

1.5 Allotment of Marks for Evaluation

Following table shows the allotment of marks for evaluation purposes.

Table: 1 Allotment of Marks

Sl No	Factors	Value Marks	Principle of Application
1	Length of the Proposed Option	10	Maximum marks for shortest route and weighted reduction with increase in length
2	Design Standards	25	Maximum marks will be given where good geometry can be provided and least marks will be given where this not possible due to site constraints
3	Structures	5	Maximum marks for minimum numbers/length and weighted reduction with increase in numbers / length. Zero for maximum number / length
4	Traffic Dispersal	5	Maximum marks for good traffic dispersal and least marks for very poor traffic dispersal
5	Environmental Constraints	25	Maximum marks where impact is least and weighted reduction as the impact increases
6	LA and Social Impact	15	
7	Cost	15	Maximum marks for least cost and weighted reduction with increase in cost

Table: 2 Qualitative Parameters of Alignment Options

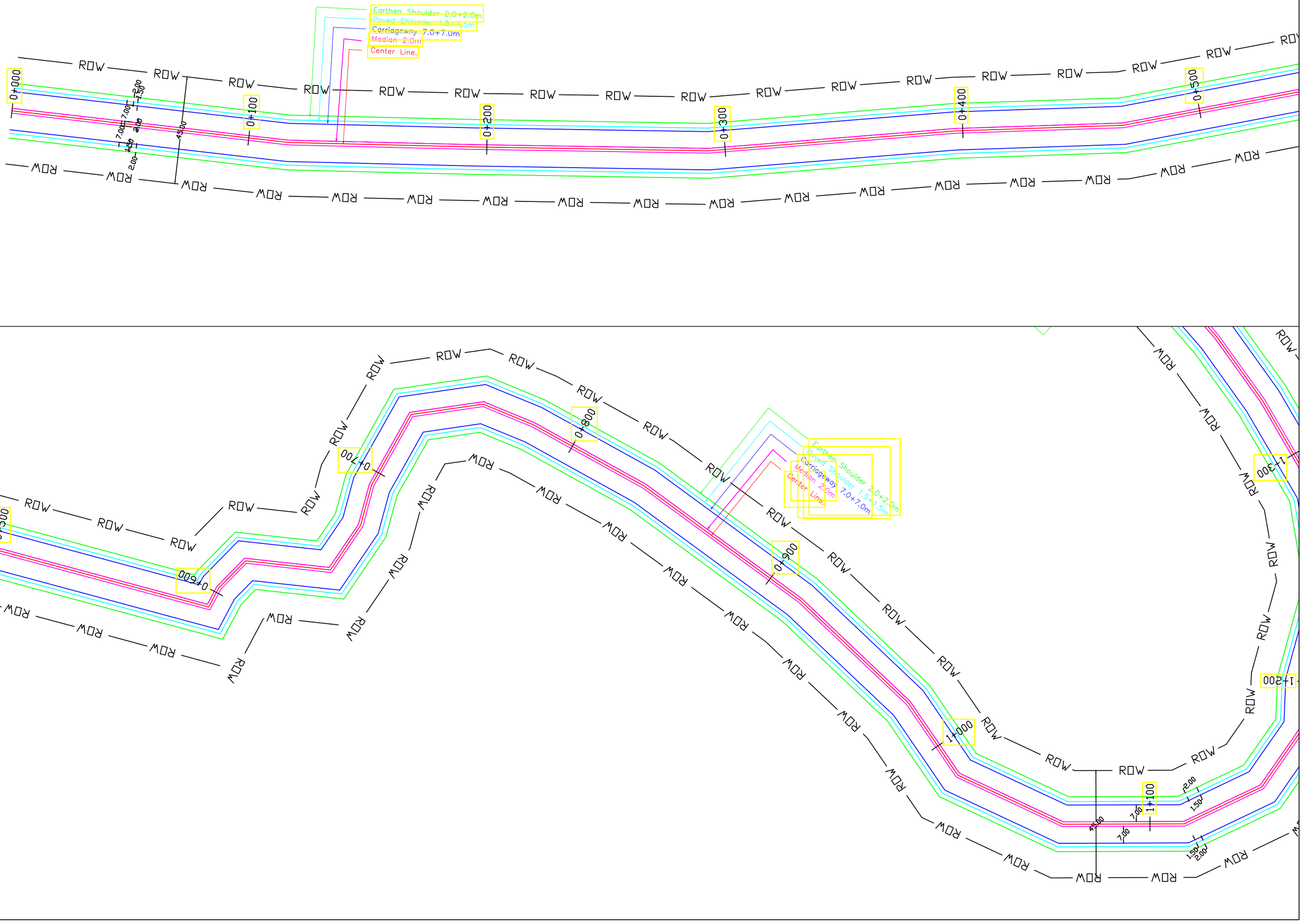
Parameters		Option-1	Option-2	Option-3
ENGINEERING	**Length**	Length=2.18 Km	Length = 1.63 km	Length = 1.3 km
	Design Standards	Longitudinal Gradient 6%	Longitudinal Gradient 7.5%	Longitudinal Gradient 10.5%
	Major Structures	NIL	NIL	NIL
	Traffic Benefit/Access Control	Good	Good	Good
ENVIRONMENTAL		Less environmental impact as less cutting involved (average cutting 7.8m)	More environmental impact as more cutting involved (average cutting more than 11m)	More environmental impact as more cutting involved (average cutting more than 14m)
SOCIO-ECONOMIC	**Land Acquisition/ Social Impact**	9.81 Hectares	6.25 Hectares	5.04
	Civil Cost (Approx.)	30 Crores	20 Crores	16 Crores

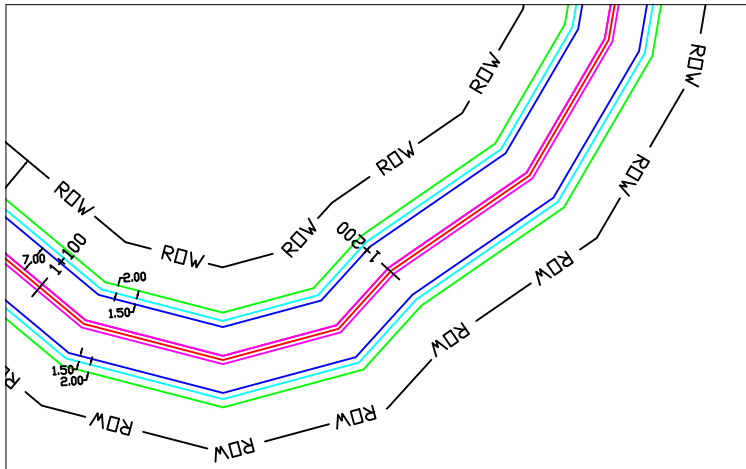
Table: 3 Mathematics Evaluation Matrix

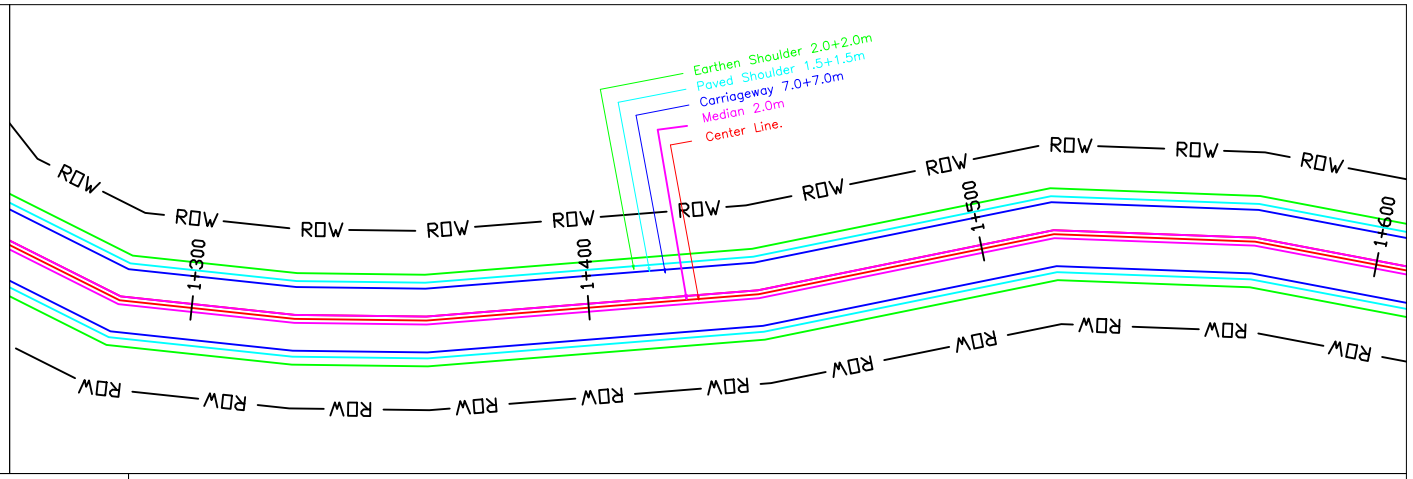
Sl. No.	Factors	Maximum Points Alloted	Option 1	Option 2	Option 3
			Points	Points	Points
1	**Length**	10	2	7.6	10
2	**Design Standards**	25	25	10	0
3	**Major Structures**	5	5	5	5
4	**Traffic Benefit**	5	5	5	5
5	**Environmental**	25	25	11.5	2
6	**Land Acquisition / Social Impact**	15	2	11.0	15
7	**Cost**	15	3	11	15

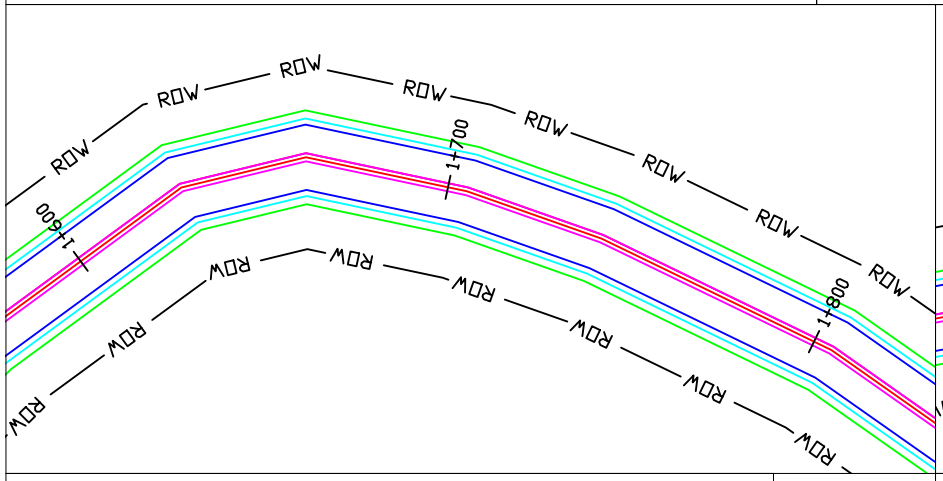
	Total Marks	**100**	**67**	**61.1**	**52**

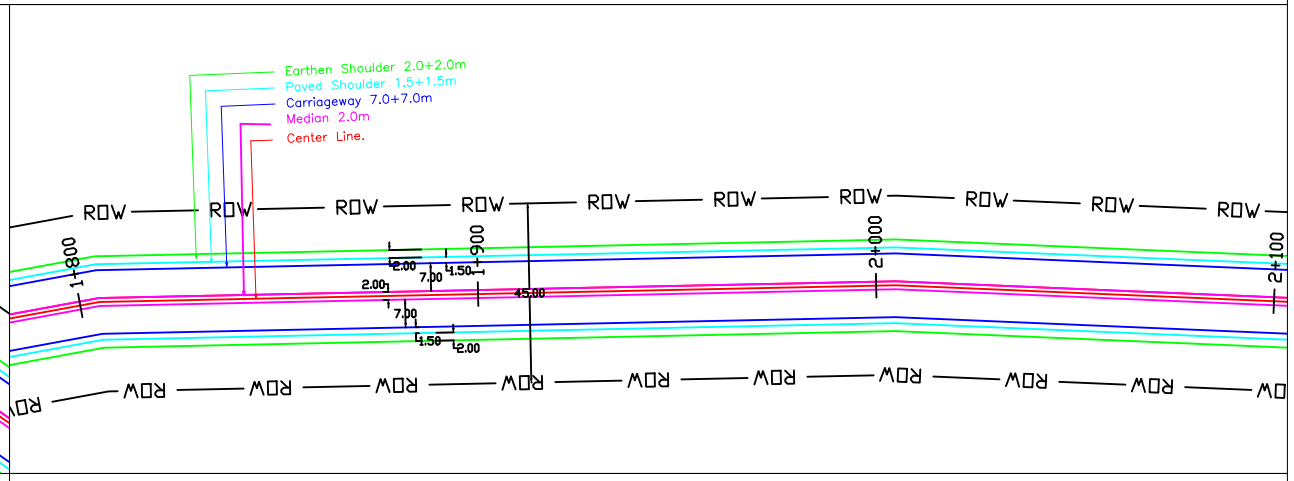
Out of 3 alignments options, option 1 is found to be more suitable as it scores maximum points from mathematical evaluation matrix.

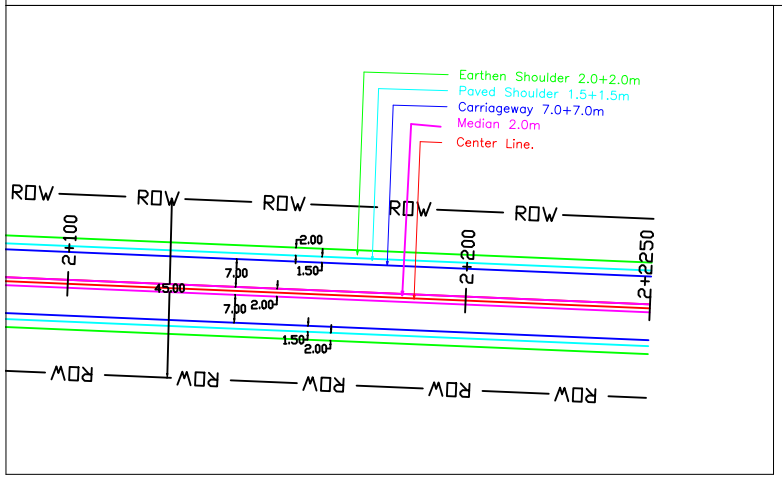

Earthen Shoulder 2.0+2.0m
Paved Shoulder 1.5+1.5m
Carriageway 7.0+7.0m
Median 2.0m
Center Line.
ROW
0+000
0+100
0+200
0+300
0+400
0+500
0+600
0+700
0+800
0+900
1+000
1+100
1+200
1+300
7.00
2.00
1.50
45.00











RIGHT OF WAY(ROW)=	45m
PRO. CARRIAGEWAY=	7.0+7.0m(BOTH SIDE)
MEDIAN =	2.0M
PAVED SHOULDER =	1.5+1.5m(BOTH SIDE)
EARTHEN SHOULDER=	2.0+2.0m(BOTH SIDE)

Report on the probability of soil erosion during construction of Sohna bypass

Objective

The study on probability of soil erosion during construction of Sohna bypass was assigned to the consultant by Haryana PWD B&R giving particular reference to the query raised by Regional Officer MOEF&CC on the Forest Diversion Proposal. The scope of the study is limited to the above mentioned query.

From engineering point of view, the probability of soil erosion can be quantitatively calculated by evaluation of stability of slopes along the project alignment.

Introduction and Background

The proposed bypass of Sohna has been proposed in hill section of Aravalli range. The main objective of the bypass is to eliminate many hairpin bends in the existing alignment and to provide four lane road. The alignment of bypass was finalized considering various alternative options. It is worthwhile to mention that the adopted alignment is most suitable considering the stability of slopes along the proposed bypass.

Causes of Soil Erosion in Barren Hills are enumerated as follows:

1. Lack of Vegetative Cover: Vegetation plays a key role in preventing erosion by stabilizing the soil with root systems. In barren hills, the absence of plants leaves the soil exposed and vulnerable to erosion.
2. Steep Slopes: The gravitational pull on steep slopes accelerates the movement of soil particles downhill, increasing erosion risk.
3. Heavy Rainfall: Precipitation can cause significant runoff in hilly areas, leading to soil displacement and erosion.
4. Wind Erosion: In areas prone to strong winds, the loose, exposed soil can be easily carried away.
5. Construction Activities: Earthmoving, excavation, and other construction activities

disturb the soil, making it more prone to erosion.

Risks associated with Soil Erosion are enumerated as follows:

1. Loss of Topsoil: Erosion removes the nutrient-rich topsoil, which is essential for vegetation growth and soil fertility.
2. Water Pollution: Eroded soil can be carried into nearby water bodies, leading to sedimentation, water quality degradation, and habitat disruption.
3. Infrastructure Damage: Uncontrolled erosion can undermine the stability of the highway structure itself, leading to increased maintenance costs and potential safety hazards.
4. Increased Flooding: Erosion can reduce the soil's ability to absorb water, increasing surface runoff and the risk of flooding downstream.

General Mitigation Strategies adopted are as follows:

1. Slope Stabilization Techniques:
   - Terracing: Creating terraces on slopes can help reduce the speed of water runoff and minimize soil erosion.
   - Retaining Walls: Constructing retaining walls can provide physical barriers to prevent soil movement.
   - Geotextiles: Using geotextile fabrics can stabilize soil and reduce erosion by reinforcing the soil structure.
2. Vegetative Cover:
   - Hydroseeding: Spraying a mixture of seeds, mulch, and nutrients onto slopes can quickly establish vegetative cover.
   - Planting Native Species: Using deep-rooted native plants can provide long-term soil stabilization.
3. Drainage Control:
   - Contour Ditches: Creating ditches along the contours of the slope can direct water flow and reduce erosion.
   - Check Dams: Installing small dams in drainage channels can slow down water flow and trap sediment.

4. Erosion Control Materials:

- Erosion Control Blankets: These biodegradable mats can be laid on the soil surface to protect it from erosion while vegetation is established.
- Silt Fences: Temporary barriers made of geotextile fabric can trap sediment and prevent it from washing away.

5. Construction Best Practices:

- Phased Construction: Completing sections of the project in phases can minimize the amount of exposed soil at any given time.
- Minimizing Disturbance: Limiting the area of soil disturbance and using machinery that causes less soil disruption can help reduce erosion.

Study of stability of slopes along the proposed greenfield road

(a) Soil investigation

As part of study, extensive soil investigation was carried out to know the engineering properties of soil. Proposed greenfield National Highway majorly passes through land having Hard rock strata below 500mm from OGL (Ordinary Ground Level). (Photo of open pit excavation attached).

(b) **Measurement of slopes along the project highway**

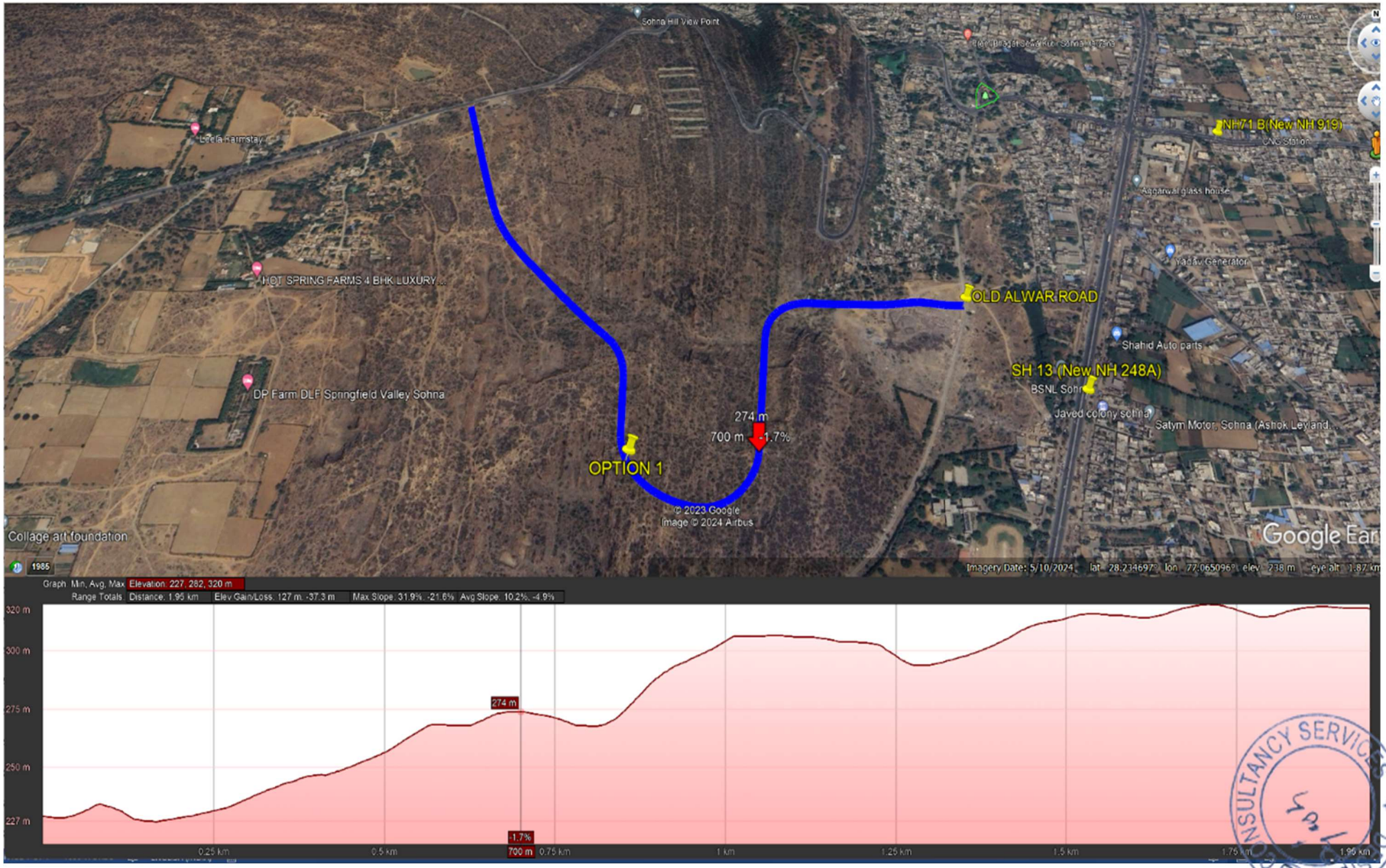
As part of study, the angle of slopes was measured along the project highway in order to establish the stability of slopes.

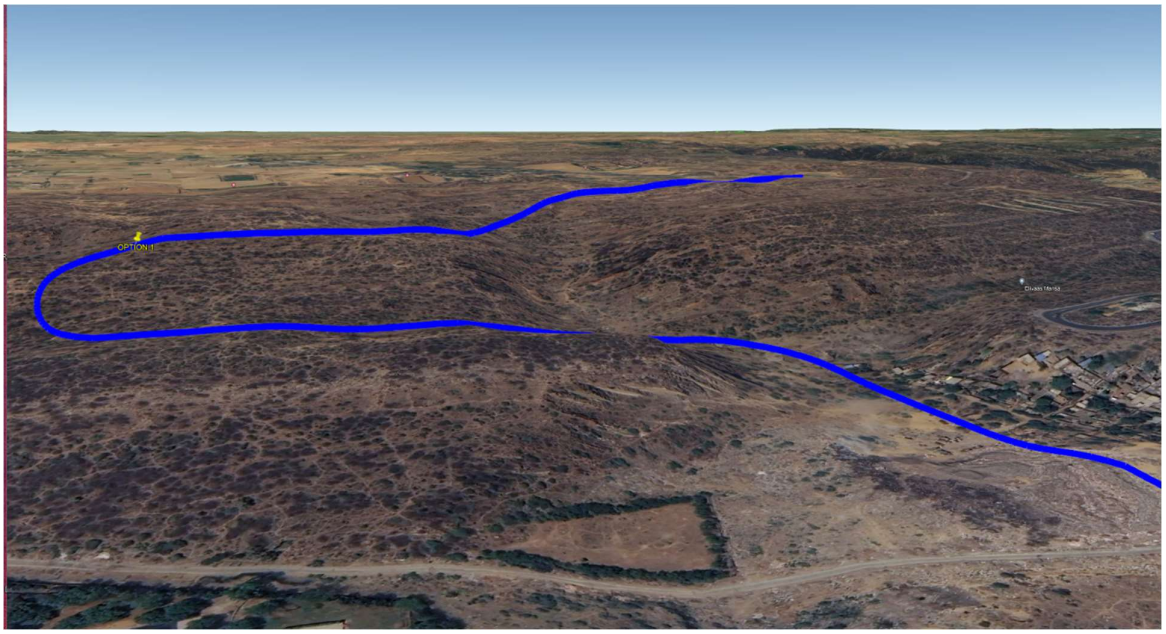
Conclusion

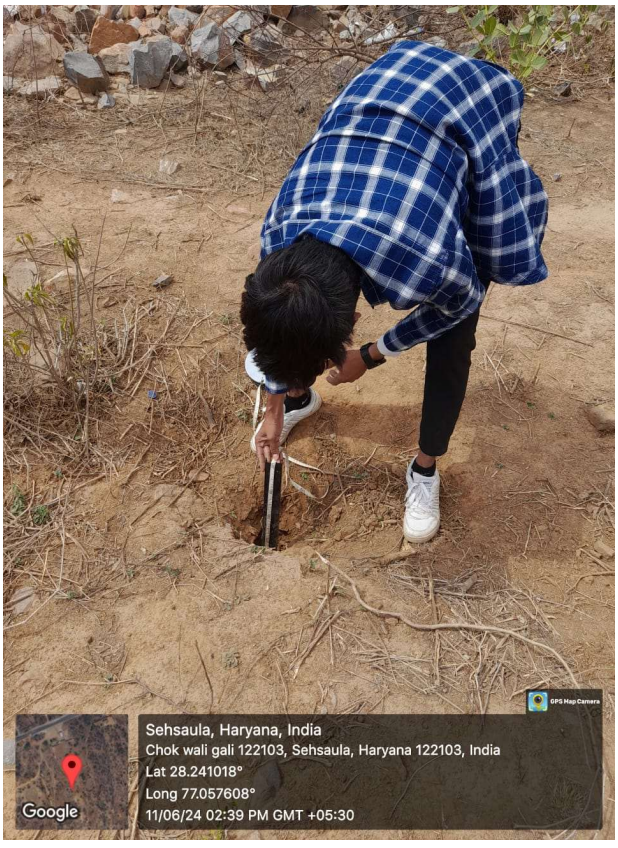
On the basis of investigation carried out in the study, it is concluded that:

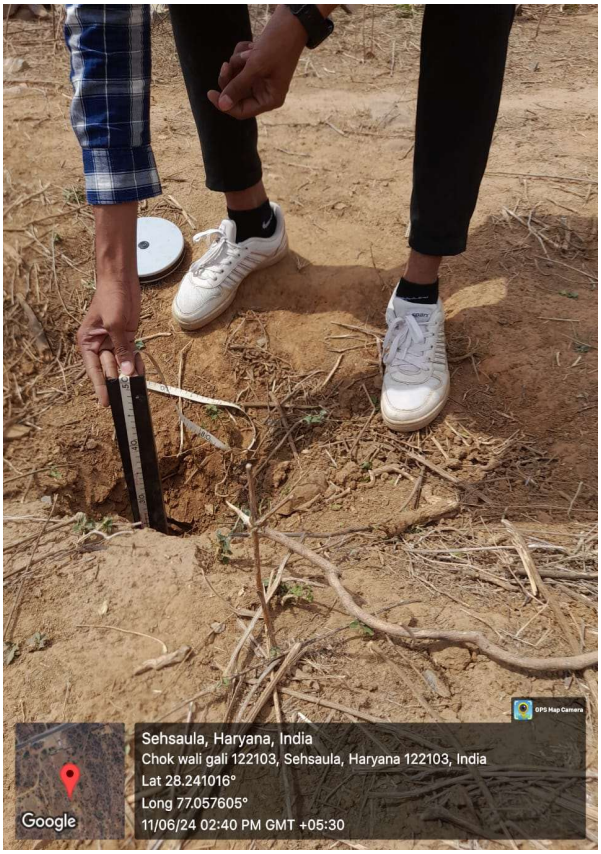
(a) The alignment finalized for the proposed Sohna Bypass is most suitable considering the stability of slopes along the proposed bypass.

(b) Soil erosion during construction period is not likely to happen on account of the stability of slopes discovered during investigation carried out in this study


Sohna Hill View Point
Leela Ramstay
HOT SPRING FARMS 4 BHK LUXURY ...
DP Farm DLF Springfield Valley Sohna
Collage art foundation
OPTION 1
274 m
700 m -1.7%
© 2023 Google
Image © 2024 Airbus
OLD ALWAR ROAD
NH71 B (New NH 919)
CNG Station
Aggarwal glass house
Yadav Generator
Shahid Auto parts
SH 13 (New NH 248A)
BSNL Sohna
Javed colony sohna
Satym Motor, Sohna (Ashok Leyland...
Google Ear
Imagery Date: 5/10/2024 lat 28.234697° lon 77.065096° elev 238 m eye alt 1.87 km
1985
Graph Min, Avg, Max Elevation: 227, 282, 320 m
Range Totals Distance: 1.95 km Elev Gain/Loss: 127 m, -37.3 m Max Slope: 31.9%, -21.6% Avg Slope: 10.2%, -4.9%
320 m
300 m
275 m
250 m
227 m
274 m
-1.7%
700 m
0.25 km
0.5 km
0.75 km
1 km
1.25 km
1.5 km
1.75 km
1.96 km







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