EXECUTIVE SUMMARY

0.1 Objective

The President of India acting through the Ministry of Road Transport & Highways (MoRT&H), Government of India, represented by the Director General (Road Development) & Special Secretary is engaged in the development of National Highways and as part of this endeavor. MoRT&H has decided to undertake 2-laning with paved shoulder and/or strengthening of the various sections of National Highways and it has entrusted NHIDCL for the execution of the DPR. National Highways and Infrastructure Development Corporation is a fully owned company of the Ministry of Road Transport & Highways, Government of India. National Highways & Infrastructure Development Corporation Limited (NHIDCL), Government of India has decided to implement the Two Laning of Demwe-Brahmakund Road (NH-13) from Km 0.00 to Km 18.464 (total length 18.464 km) in the state of Arunachal Pradesh on EPC mode. Accordingly, NHIDCL intends to take up the preparation of the feasibility and detailed project report for same.

Demwe-Brahmakund Road section (total length 18.464 km) of NH- 13 is a part of National Highway 13, part of the larger Trans-Arunachal Highway network, is a 1,559 km long two-lane national highway across Arunachal Pradesh in India running from Tawang in northwest to Wakro in southeast. The project preparation for 2-laning with hard shoulder which is taken by MoRTH on priority basis.

In order to, access the financial and technical feasibility **M/s S.M. Consultants.** have been entrusted by MoRT&H for carrying out the task of Demwe-Brahmakund section (length about 18.464 km) of NH-13 as a part of such National Highways, project preparation for 2- laning/2-laning with paved shoulder which is taken by MoRTH on priority basis.

0.2 Project Road Description

starts from 0/000 km existing chainage at Demwe and ends near T-Junction leading to Parshuramkund. The existing project road length is 27.075 km. Lohit is an administrative district in the state of Arunachal Pradesh in India. The district headquarters are located at Tezu.

The existing length of the project road traverses in Lohit district from Km 0.00 to Km 27.075 of T-Junction leading to Parshuramkund is 27.075 Kms.

The project road is traverses from KM 0.00 to KM 2.00 on the existing road alignment and takes up the greenfield till KM 15.350 and afterwards follows the existing road alignment upto the termination point at KM 18.464.

0.3 Abutting Land Use Pattern

A considerable part of the corridor passes through dense forest with minimal settlements. It passes by the BRTF Camp at the start of the project road

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0.4 Geology

Geology plays an important role in shaping the seismicity, vegetation, surface and groundwater scenario of an area. So, it becomes imperative to know the geology of the project districts The

Geological formation of the Project districts is described as follows:

The project roads come under the influence of Lohit districts of Arunachal Pradesh. Lohit district is the largest district of Arunachal Pradesh with an area of 5212 sq.km. It borders Lower Dibang Valley on East, Changlang & Lohit on the South & China & Tibet on the North-west. The district has mountainous tracts. On account of the existence of the hill ridges and the valleys its topography assumes typical character. The hill ridges are situated haphazardly. As soon as one ends the other ridge starts either parallel or in opposite direction. At these intervals the wide or narrow valleys get the foothills constituting 20 per cent to total geographical area of district. The wide and narrow valleys share 35 per cent each to total geographical area. The rest about 10 percent is the snow clad peaks. Due to typical topography the rivers are undulated. There are numerous streams and rivers and are drained by principal river Lohit, Naodihing etc. in the district of Lohit and Tidding, Dalai, Dau, Lohit are the major rivers flowing in the districts of Anjaw. These principal rivers of the district are drained by the westerly flowing Brahmaputra. These rivers have rendered the human habitations into geographical isolations. At the same time these rivers possess high hydro-power potential. It could be developed as a good industry. Geomorphologically, Lohit district can be broadly divided into two categories Structural hills and Piedmont plains. Structural hills consist of valleys and ridges of definite trend lines. Piedmont plains are the plains in the foot hill belt of structural hills. All the major settlements like Tezu, Namsai etc. comes under piedmont plains.

0.5 Important Settlements

There are a number of important towns and villages along the alignment. These are
(1) Demwe near 0.000 km,
(2) Kathan New near 6.000 km
(3) Lamliang near 11.000 km
(4) Parshuram Kund near 18.464 km.

0.6 Right of Way

The Right of Way (ROW) boundary stones are not available at any locations along the project corridor. Structures are present along the road in some sections. The proposed Right of Way is 24 m.

0.7 Traffic

To establish the traffic characteristics along the project road, Consultants have carried out 7 days Classified Traffic Volume Counts at Khupa junction.
The Average Annual Daily Traffic (AADT) in the base year 2017 for the project road is presented in **Table 0.1**.

Table 0.1: The AADT in the Year 2016 on the Two Packages

Homogeneous Section	From (km)	To(km)	Length (km)	AADT (No)	AADT (PCU)
HS-1	0.000	18.464	18.464	144	158.5

Projected traffic is given in **Table 0.2** for the homogeneous section HS-1.

Table 0.2: Projected Traffic

Projected Year	Tohangam Junction (16/400 km)	
	Total vehicles	PCU
2017	144	158
2018	153	169
2019	163	182
2020	174	195
2021	185	209
2022	196	222
2023	207	236
2024	219	250
2025	232	265
2026	246	282
2027	260	298
2028	275	316
2029	290	333
2030	305	351
2031	322	371
2032	340	391
2033	359	413
2034	378	434

0.8 Pavement Design

The pavement composition to be considered is given below:

(a) New Construction

The adopted pavement thicknesses for new pavement are given in **Table 0.3**.

Table 0.3: Pavement Composition for New Pavement

Pavement Composition	Thickness (mm)
BC	30
DBM	50
WMM	250
GSB	200
Sub-grade	500

The pavement of main carriageway shall be designed for design traffic of 20 MSA for non bituminous courses & 5 MSA for bituminous courses with a minimum design period of 20 years. Maximum value of CBR to be taken for design shall not exceed 8%.

(b) Widening stretches

The adopted pavement thicknesses for widened pavement are given in **Table 0.4**.

Table 0.4: Pavement Composition for Widened Pavement

Pavement Composition	Thickness (mm)	

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Pavement Composition	Thickness (mm)	
BC	30	(Overlay)
DBM	50	(Overlay)
WMM	250	(Overlay)
GSB	200	(Widening)

20 MSA and 1.06 characteristic deflections have been considered for the overlay of the above pavement design as per IRC 81-1997.

Life Cycle cost analysis was done to compare the financial impact between both the flexible and the rigid pavements. **Considering low traffic road, use of rigid pavement will not be economical.**

0.9 Road Junctions / Intersections

There are one major intersection and 8 minor intersection (as shown in **Table 0.5**) along the project road.

Table 0.5: List of Junctions /Intersections

Sl.No	Existing. Chainage (km)	Connecting places	Type of Road	Remarks
1	0.38	48 BRTF	Y	Right
2	2.00	Existing Alignment	Y	Left
3	16.48	Existing Alignment	Y	Left
4	25.89	Parshuram Kund	Y	Right

0.10 Cross Drainage Works

There are 2 major bridges, and 13 minor bridges existing along the project road. Depending on the condition of bridges they are recommended for retained, widening and reconstruction. 12 new minor bridges are proposed for construction.

24 slab culverts exist along the project road and most of them need to be reconstructed. As per the proposal, 78 culverts are to be reconstructed/ newly constructed out of which 54 new culverts are proposed.

0.11 Cost Estimates

Unit rates were primarily estimated by using the MoRTH, Standard Data Book of Rate Analysis and PWD SOR – Arunachal Pradesh (2014) by providing the necessary cost inputs related to labour, material and equipment. Unit rates for other items of work were finalized after considering the current market rates or from information or other major projects of similar standards.

The basic rates of machinery, materials, labour have been escalated for the current year by 10% /year.

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