

**Consultancy Services for preparation of Feasibility Study and Detailed Project Report for Two laning of Joram – Koloriang Road (NH – 713) from Km.20.00 to Km. 70.00 & Km. 138.00 to Km. 158.00 (Total Length 70 km) in the State of Arunachal Pradesh on EPC mode(Package No. DPR/J-K/AR-1/SARDP-NE)**

# **EXECUTIVE SUMMARY**



## EXECUTIVE SUMMERY

### 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 endeavour, MoRT&H has decided to undertake 2laning 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 Joram – Koloriang Road (NH-713) from Km 20.00 to Km 70.00 & Km 138.00 to Km 158.000 (total length 70km) 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.

Joram to Koloriang section (length about 70km) of NH- 713 is a part of such National Highways, project preparation for 2laning with paved shoulder which is taken by MoRTH on priority basis.

In order to access the financial and technical feasibility M/s **Voyants Solutions Private Limited** have been entrusted by MoRT&H the task of carrying out the Joram to Koloriang section (length about 70km) of NH- 713 as a part of such National Highways, project preparation for 2 laning/2laning with paved shoulder which is taken by MoRTH on priority basis.

### 0.2 Project Road Description

The project road takes off from NH-229 at Joram Junction very near to Joram church. Joram is about 14 km south of the location Ziro in the district of Lower Subansiri. However, the first 20 km (From km 0.00 to km 20.000) is being implemented by the BRO and outside the scope of this project and comes under the district of Lower Subansiri. Km 20.00 to km 70.00 is the first stage of this subject project and under districts of Lower Subasiri as well as Kra Daadi. New Palin town is the last point of this project. Then again km 70.00 to km 138.00 is under the scope of a different agency, being under project preparation stage through MORTH and falls in the district of Kurung Kumey. The last stage under this contract begins at km 138.00 and end at km 158.00 at Koloriang which is the district Head Quarter of Kurung Kumey district.

The existing length of the project road is 70 kms and it traverses through the districts of Lower Subansiri, Kra Daadi and Kurung Kumey.

The project road is not continuous. The first part is of length 50.0km (from km 20.00 to km 70.00 near New Palin town) and the second part is of length 20.00km (from km 138.00 to km 158.00).

### 0.3 Abutting Land Use Pattern

A considerable part of the corridor passes through forest stretches. The existing abutting land use pattern for the balance reaches is predominantly agricultural. Besides, at few stretches it is found built up and open/hilly in nature.

### 0.4 Terrain

Terrain is generally mountainous and steep.

### 0.5 Important Settlements

There are two important towns along the alignment. These are (1) New Palin near km 69.00, (2) Koloriang near km 158.00. The other settlements in general are villages with scattered kutcha houses. These are (1) New Pania near km 24.00, (2) Neelum near km 32.00, (3) Deed near km 35.200, (4) Daam near km 42.00, (5) Shakti near km 58.00.

### 0.6 Right of Way

The road land boundary pillars are not found along the road as dense forests abut either side of the existing road. According to site observations, the width from the road shoulder edge adjoining the valley side to the shoulder edge along the hill face varies from 9m to 12m. The proposed ROW is taken as 18m to 35m, in general, except at built up areas where 14m total ROW has been considered. Total quantum of LA, is 41.00Ha for km 138.00 to km 158.00/km 154.036 and 105.00ha for km 20.00 to km 70.00/km 59.363.

### 0.7 Traffic

To establish the traffic characteristics along the project road, Consultants have carried out 7 days Classified Traffic Volume Counts at a couple of locations.

The Average Annual Daily Traffic (AADT) in the base year 2016 for the two packages 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)
Km 20.000 To Km 58.716	20.000	70.00/59.363	39.363	560	595
Km 138.000 To Km 154.036	138.000	158.00/154.036	16.036	528	607

The adopted traffic growth rates are presented in **Table 0.2**.



**Table 0.2: The Adopted Traffic Growth Rates**

Vehicle Type	Final Traffic Growth Rates (%)			
	2016-2020	2021-2025	2026-2030	Beyond 2030
Cars	5.0	5.0	5.0	5.0
Two Wheelers	5.0	5.0	5.0	5.0
Buses	5.0	5.0	5.0	5.0
LCV	5.0	5.0	5.0	5.0
2-Axle Trucks	5.0	5.0	5.0	5.0
3-Axle Trucks	5.0	5.0	5.0	5.0
MAV	5.0	5.0	5.0	5.0

Projected traffic are given in **Table 0.3** for two homogeneous section.

**Table 0.3: Projected Traffic**

Year	At km 67+500		At km 155+200	
	Nos	PCU	Nos	PCU
2016	560	595	527	575
2017	588	624	553	603
2018	617	656	581	633
2019	788	951	743	965
2020	827	998	781	1013
2021	869	1048	820	1063
2022	912	1100	861	1117
2023	958	1155	904	1172
2024	1006	1213	949	1231
2025	1056	1274	996	1293
2026	1109	1338	1046	1357
2027	1164	1404	1098	1425
2028	1222	1475	1153	1496
2029	1283	1548	1211	1571
2030	1348	1626	1271	1650
2031	1415	1707	1335	1732
2032	1486	1793	1402	1819
2033	1560	1882	1472	1910
2034	1638	1976	1545	2005
2035	1720	2075	1623	2105
2036	1806	2179	1704	2211
2037	1896	2288	1789	2321

Year	At km 67+500		At km 155+200	
	Nos	PCU	Nos	PCU
2038	1991	2402	1878	2437
2039	2091	2522	1972	2559
2040	2195	2648	2071	2687
2041	2305	2781	2175	2821
2042	2420	2920	2283	2963
2043	2541	3066	2397	3111
2044	2668	3219	2517	3266
2045	2802	3380	2643	3429
2046	2942	3549	2775	3601
2047	3089	3726	2914	3781
2048	3243	3913	3060	3970
2049	3405	4108	3213	4169
2050	3576	4314	3373	4377
2051	3754	4530	3542	4596
2052	3942	4756	3719	4826
2053	4139	4994	3905	5067
2054	4346	5244	4100	5320
2055	4563	5506	4305	5586
2056	4792	5781	4521	5866
2057	5031	6070	4747	6159
2058	5283	6374	4984	6467
2059	5547	6692	5233	6790

From the projected traffic it is thus recommended to provide 2-lane wide carriageway with paved shoulders.

## 0.8 Pavement Design

The pavement composition to be considered is given below:

### (a) New Construction and Widening Stretches

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

**Table 0.4: Pavement Composition for New/Widened Pavement**

Pavement Composition	Thickness (mm)
BC	40



Pavement Composition	Thickness (mm)
DBM	80
WMM	250
GSB	200
Sub-grade	500

20 MSA and Sub-grade CBR of 10% (4 Days Soaked) for 15 years design period has been considered for the above pavement design as per IRC:SP:73-2015 of Paragraph 5.4.1

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 is one major junctions (as shown in Table 0.5) and 61 minor Junctions along the project road.

Table 0.5 : List of Major Junctions

Sl.No	Name	Ex. Chainage (km)	Side		Type of Junction	Type of Road	Remarks
			LHS	RHS			
1	Koloriang	158.000	IB Bungalow, Kurung Kumey Town	Circuit House	4-Arm	BT	NH-713

### 0.10 Cross Drainage Works

There are no major bridges, and 10 minor bridges existing along the project road. Depending on the condition of bridges they are recommended for retained, widening and reconstruction. 323 culverts exist along the project road and most of them need to be reconstructed.

### 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 5% /year.

The abstract of civil cost estimates for the entire project road has been presented in Table 0.6 - Table 0.9





**Table 0.6: ABSTRACT OF COST : PACKAGE- I (KM 20+000 to KM 32+050)**

Sl. No	Description	Percentage Weightage vis a vis overall project	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	<b>Design Length in Km</b>	<b>12.050</b>		
	<b>A- Widening and strengthening of existing road</b>			
<b>Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures (but excluding service roads)</b>	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.	65.39%	161995996	13.10%
	(2) Granular work (sub- base, shoulders)		45503744	3.68%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		50498325	4.08%
	b)BC with Tack coat.		31250459	2.53%
	<b>B - New 2-Lane alignment</b>			
	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.		263673627	21.32%
	(2) Granular work (sub- base, shoulders)		63310979	5.12%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		71285424	5.77%
	b)BC with Tack coat.		44006536	3.56%
	<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>			
	(1)Box / Slab culvert		76977320	6.23%
			<b>D-Other Engineering Works</b>	
<b>Other Works</b>	Road Appurtenances	34.61%	1027926	0.08%
	Road side drain & toe wall		50753318	4.10%
	Traffic Sign		700821	0.06%
	Pavement Marking		4714076	0.38%
	Crash barrier/W metal crash barrier		15971706	1.29%
	Protection Work (Provision of Rip-Rap or similar work in valley side of the curves as special safety features)		2963200	0.24%
	Boundary stone, km Stone,5th km stone and hectometer stone		112690	0.01%
	Traffic blinker LED delineator, stud, reflective payment marker, tree reflector		2859968	0.23%
	Bus bays and Bus Shelter		1089468	0.09%
	Minor Junction		18779663	1.52%
	Overhead signboard		313047	0.03%

Sl. No	Description	Percentage Weightage vis a vis overall project	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	Plantation (Vetiver, Hydro seeding and Mulching or similar techniques etc.) for slope protection on exposed hill slopes as slide mitigation measure.		40669800	3.29%
	Road side drain I/C chute drain		19827600	1.60%
	Repair for protection work			
	Passing Places		1018039	0.08%
	(vi)Repairs to bridges/structures			
	(vii)Protection Works			
	Breast Wall		228245804	18.46%
	Retaining Wall		21889507	1.77%
	Parapet		17056060	1.38%
A	<b>Civil Cost</b>		<b>1236495103</b>	<b>123.65</b>
	Cost/KM at Civil Cost		102613702	10.26
B	Contingency Charges @ 2.8% of Civil Cost (A)	2.80%	34621863	3.46
C	<b>SUB TOTAL (A+B)</b>		<b>1271116966</b>	<b>127.11</b>
D	Supervision @ 3% on C	3.00%	38133509	3.81
E	Agency Charges @ 3% on C	3.00%	38133509	3.81
F	Quality Control @ 0.25 % on C	0.25%	3177792	0.32
G	Road Safety Cell Audit Charges @ 0.25% on C	0.25%	3177792	0.32
H	<b>Sub-Total (C+D+E+F+G)</b>		<b>1353739569</b>	<b>135.37</b>
I	Maintenance for 4 years @ 5% on C	5.00%	63555848	6.36
J	Escalation @ 5% per annum for 3 years on C	5.00%	190667545	19.07
K	<b>Grand Total (H+I+J)</b>		<b>1607962962</b>	<b>160.80</b>
	Cost of Land Acquisition etc.		6455000	0.65
	Solatium Charges @ 30% on land value		1936500	
	Establishment Charges @ 8% on land value		516400	
	Contingency Charges @ 2% on land value		129100	
	Total Cost of Land Acquisition etc.		9037000	
	Total Cost of R&R		7500000	
	Shifting of Utility Service		6061000	0.61
	Environment Cost		6061000	0.61
	<b>Total Cost</b>		<b>1636621962</b>	<b>163.66</b>
	<b>Cost/KM at Total Cost</b>		<b>135819250</b>	<b>13.58</b>



**Table 0.7: ABSTRACT OF COST : PACKAGE- II (KM 32+050 to KM 44+000)**

Item	Description	Weightage in percentage to the Contact Price	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	Design Length in Km	11.950		
	<b>A- Widening and strengthening of existing road</b>			
<b>Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures</b>	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.	73.19%	105443117	8.46%
	(2) Granular work (sub- base, shoulders)		27241048	2.19%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		31906879	2.56%
	b)BC with Tack coat.		17364819	1.39%
	<b>B - New 2-Lane alignment</b>			
	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.		375821828	30.15%
	(2) Granular work (sub- base, shoulders)		79906647	6.41%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		94185678	7.55%
	b)BC with Tack coat.		51327692	4.12%
	<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>			
	(1)Box / Slab culvert		103966492	8.34%
	(2) Minor Bridge		25238910	2.02%
	D-Other Engineering Works			
<b>Other Works</b>	Road Appurtenances	26.81%	665883	0.05%
	Protection Work (Provision of Rip-Rap or similar work in valley side of the curves as special safety features)		1654400	0.13%
	Road side drain & toe wall		55058103	4.42%
	Traffic Sign		632032	0.05%
	Pavement Marking		4711114	0.38%
	Crash barrier/W metal crash barrier		14220946	1.14%
	Boundary stone, km Stone,5th km stone and hectometer stone		99109	0.01%
	Traffic blinker LED delineator, stud, reflective payment marker, tree reflector		329284	0.03%
	Bus bays and Bus Shelter		363156	0.03%



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Item	Description	Weightage in percentage to the Contact Price	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	Minor Junction		11556716	0.93%
	Plantation (Vetiver, Hydro seeding and Mulching or similar techniques etc.) for slope protection on exposed hill slopes as slide mitigation measure.		22548360	1.81%
	Road side catch water drain		13345500	1.07%
	Passing Places		1018039	0.08%
	Breast Wall		180085115	14.45%
	Retaining Wall		18881012	1.51%
	Parapet		9116000	0.73%
<b>A</b>	<b>Civil Cost</b>		<b>1246687879</b>	<b>124.67</b>
	Cost/KM at Civil Cost		104325346	10.43
<b>B</b>	Contingency Charges @ 2.8% of Civil Cost (A)	2.80%	34907261	3.49
<b>C</b>	<b>SUB TOTAL (A+B)</b>		<b>1281595139</b>	<b>128.16</b>
<b>D</b>	Supervision @ 3% on C	3.00%	38447854	3.84
<b>E</b>	Agency Charges @ 3% on C	3.00%	38447854	3.84
<b>F</b>	Quality Control @ 0.25 % on C	0.25%	3203988	0.32
<b>G</b>	Road Safety Cell Audit Charges @ 0.25% on C	0.25%	3203988	0.32
<b>H</b>	<b>Sub-Total (C+D+E+F+G)</b>		<b>1364898823</b>	<b>136.49</b>
<b>I</b>	Maintenance for 4 years @ 5% on C	5.00%	64079757	6.41
<b>J</b>	Escalation @ 5% per annum for 3 years on C	5.00%	192239271	19.22
<b>K</b>	<b>Grand Total (H+I+J)</b>		<b>1621217851</b>	<b>162.12</b>
	Cost of Land Acquisition etc.		6455000	0.65
	Solatum Charges @ 30% on land value		1936500	0.19
	Establishment Charges @ 8% on land value		516400	0.05
	Contingency Charges @ 2% on land value		129100	0.01
	Total Cost of Land Acquisition etc.		9037000	0.90
	Total Cost of R&R		7500000	0.75
	Shifting of Utility Service		6061000	0.61
	Environment Cost		6061000	0.61
	<b>Total Cost</b>		<b>1649876851</b>	<b>164.99</b>
	<b>Cost/KM at Total Cost</b>		<b>138065008</b>	<b>13.81</b>



**Table 0.8: ABSTRACT OF COST: PACKAGE- III (KM 44+000 to KM 59+363)**

Sl. No	Description	Weightage in percentage to the Contact Price	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	<b>Design Length in Km</b>	<b>15.363</b>		
	<b>A- Widening and strengthening of existing road</b>			
<b>Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures</b>	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock	74.18%	310392536	18.94%
	(2) Granular work (sub- base, shoulders)		57298638	3.50%
	(3) Bituminous work			
	a)DBM		69034849	4.21%
	b)BC with Tack coat and prime coat		37585134	2.29%
	(4)Widening and repair of culvert		140000	0.01%
	<b>B - New 2-Lane alignment</b>			
	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock		326237944	19.91%
	(2) Granular work (sub- base, shoulders)		78191619	4.77%
	(3) Bituminous work			
	a)DBM		92164181	5.63%
	b)BC with Tack coat and prime coat		50226051	3.07%
	<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>			
	(1)Box / Slab culvert		122023750	7.45%
	(2) Minor Bridge		72137970	4.40%
	<b>D-Other Engineering Works</b>			
<b>Other Works</b>	Road Appurtenances	25.82%	640563	0.04%
	Protection Work (Rip-rap)		2583040	0.16%
	Road side drain & toe wall		101696074	6.21%
	Traffic Sign		715900	0.04%
	Pavement Marking		6055356	0.37%
	Crash barrier/W metal crash barrier		10675657	0.65%
	Boundary stone, km Stone, 5th km stone and hectometer stone		144871	0.01%
	Traffic blinker LED delineator, stud, reflective payment marker, tree reflector		513917	0.03%
	Bus bays and Bus Shelter		726312	0.04%
	Minor Junction		13723600	0.84%





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Sl. No	Description	Weightage in percentage to the Contact Price	Amount (in RS)	percentage Weightage vis a vis Overall Project Cost
	Overhead Sign board		313047	0.02%
	Plantation		30384620	1.85%
	Road side drain		17936352	1.09%
	Truck layby		1435204	0.09%
	Passing Places		1018039	0.06%
	Breast Wall		204583917	12.49%
	Retaining Wall		15333363	0.94%
	Parapet		14518656	0.89%
<b>A</b>	<b>Civil Cost</b>		<b>1638431160</b>	<b>163.84</b>
	Cost/KM at Civil Cost		106647866	10.66
<b>B</b>	Contingency Charges @ 2.8% of Civil Cost (A)	2.80%	45876072	4.59
<b>C</b>	<b>SUB TOTAL (A+B)</b>		<b>1684307232</b>	<b>168.43</b>
<b>D</b>	Supervision @ 3% on C	3.00%	50529217	5.05
<b>E</b>	Agency Charges @ 3% on C	3.00%	50529217	5.05
<b>F</b>	Quality Control @ 0.25 % on C	0.25%	4210768	0.42
<b>G</b>	Road Safety Cell Audit Charges @ 0.25% on C	0.25%	4210768	0.42
<b>H</b>	<b>Sub-Total (C+D+E+F+G)</b>		<b>1793787202</b>	<b>179.38</b>
<b>I</b>	Maintenance for 4 years @ 5% on C	5.00%	84215362	8.42
<b>J</b>	Escalation @ 5% per annum for 3 years on C	5.00%	252646085	25.26
<b>K</b>	<b>Grand Total (H+I+J)</b>		<b>2130648649</b>	<b>213.06</b>
	Cost of Land Acquisition etc.		8391000	<b>0.84</b>
	Solatum Charges @ 30% on land value		2517300	
	Establishment Charges @ 8% on land value		671280	
	Contingency Charges @ 2% on land value		167820	
	<b>Total Cost of Land Acquisition etc.</b>		<b>11747400</b>	
	<b>Total Cost of R&amp;R</b>		<b>7500000</b>	
	Shifting of Utility Service		6061000	<b>0.61</b>
	Environment Cost		6061000	<b>0.61</b>
	<b>Total Cost</b>		<b>2162018049</b>	<b>216.20</b>
	<b>Cost/KM at Total Cost</b>		<b>140728897</b>	<b>14.07</b>

**Table 0.9: ABSTRACT OF COST: PACKAGE- IV (KM 138+000 to KM 154+036)**

Item	Description	Weightage in percentage to the Contact Price	Amount (in RS)	Percentage Weightage vis a vis Overall Project Cost
	<b>Design Length in Km</b>	<b>16.036</b>		
	<b>A- Widening and strengthening of existing road</b>			
<b>Road works including culverts, minor bridges, underpasses, overpasses, approaches to ROB/RUB/ Major Bridges/ Structures (but excluding service roads)</b>	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.	72.23%	142289599	8.07%
	(2) Granular work (sub- base, shoulders)		39600004	2.24%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		44925451	2.55%
	b)BC with Tack coat.		24558083	1.39%
	<b>B - New 2-Lane alignment</b>			
	(1) Earthwork up to top of the sub-grade including excavation in soil, soft rock and hard rock including Cleaning & grubbing with required site clearance etc.		376028474	21.32%
	(2) Granular work (sub- base, shoulders)		98335542	5.57%
	(3) Bituminous work			
	a)DBM With Prime coat & Tack coat.		111238516	6.31%
	b)BC with Tack coat.		60896469	3.45%
	<b>C- New culverts, minor bridges, underpasses, overpasses on existing road, realignments, bypasses:</b>			
	(1)Box / Slab culvert		245928058	13.94%
	(2) Minor Bridges		130445450	7.39%
<b>D-Other Engineering Works</b>				
<b>Other Works</b>	Major Junction	27.77%	2398057	0.14%
Road Appurtenances	750600		0.04%	
Road side drain & toe wall	80828385		4.58%	
Traffic Sign	3306761		0.19%	
Pavement Marking	6352320		0.36%	
Crash barrier/W metal crash barrier	17153469		0.97%	
Protection Work (Provision of Rip-Rap or similar work in valley	2329600		0.13%	



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Item	Description	Weightage in percentage to the Contact Price	Amount (in RS)	Percentage Weightage vis a vis Overall Project Cost
	side of the curves as special safety features)			
	Boundary stone, km Stone,5th km stone and hectometer stone		204397	0.01%
	Traffic blinker LED delineator, stud, reflective payment marker, tree reflector		463493	0.03%
	Bus bays and Bus Shelter		309158	0.02%
	Minor Junction		7194170	0.41%
	Overhead signboard		643797	0.04%
	Plantation (Vetiver, Hydro seeding and Mulching or similar techniques etc.) for slope protection on exposed hill slopes as slide mitigation measure.		29173920	1.65%
	Road side drain I/C chute drain, catch water drain		33572000	1.90%
	Passing Places		2532192	0.14%
	(vii)Protection Works			
	Breast Wall		234659095	13.30%
	Retaining Wall		63959850	3.63%
	Breast Wall Sausage Type		0	0.00%
	Parapet		4052620	0.23%
	<b>Civil Cost</b>		<b>1764129530</b>	<b>176.41</b>
	<b>Cost/KM at Civil Cost</b>		<b>110010572</b>	<b>11.00</b>
B	Contingency Charges @ 2.8% of Civil Cost (A)	2.80%	49395627	4.94
C	<b>SUB TOTAL (A+B)</b>		<b>1813525157</b>	<b>181.35</b>
D	Supervision @ 3% on C	3.00%	54405755	5.44
E	Agency Charges @ 3% on C	3.00%	54405755	5.44
F	Quality Control @ 0.25 % on C	0.25%	4533813	0.45
G	Road Safety Cell Audit Charges @ 0.25% on C	0.25%	4533813	0.45
H	<b>Sub-Total (C+D+E+F+G)</b>		<b>1931404292</b>	<b>193.14</b>
I	Maintenance for 4 years @ 5% on C	5.00%	90676258	9.07
J	Escalation @ 5% per annum for 3 years on C	5.00%	272028774	27.20
K	<b>Grand Total (H+I+J)</b>			<b>229.41</b>
	Cost of Land Acquisition etc.		7796100	
	Solatum Charges @ 30% on land value		2338830	
	Establishment Charges @ 8% on land value		623688	



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Item	Description	Weightage in percentage to the Contact Price	Amount (in RS)	Percentage Weightage vis a vis Overall Project Cost
	Contingency Charges @ 2% on land value		155922	
	Total Cost of Land Acquisition etc.		10914540	
	Total Cost of R&R		7500000	
	Shifting of Utility Service		11471000	
	Environment Cost		22942000	
	<b>Total Cost</b>		<b>2346936863</b>	<b>234.69</b>
	<b>Cost/KM at Total Cost</b>		<b>146354257</b>	<b>14.64</b>