PREPARATORY STUDY FOR ROAD NETWORK IMPROVEMENT IN NORTH-EAST STATES OF INDIA

Preliminary Design of NH54 Bypass

Cost Estimate Report (Draft as of 7 July 2016)

ABSTRACT OF COST ESTIMATE

S. NO.	DESCRIPTION	AMOUNT (Rs, Lac)	SHARE
(A) CON	STRUCTION COST	(HS, Euc)	
A1	SITE CLEARANCE	2.8	0.05%
A2	EARTHWORK	864.0	15.62%
A3	PAVEMENT	1,465.7	26.49%
A4	DRAINAGE	269.6	4.87%
A5	BRIDGE	0.0	0.00%
A6	SLOPE PROTECTION	2,809.1	50.78%
A7	TRAFFIC SAFETY FACILITIES	120.5	2.18%
A8	ROAD APPURTENANCES	0.7	0.01%
	TOTAL OF (A-1)	5,532.4	100%
	CONSTRUCTION COST PER KM	2,150.2	
A9	ESCALATION (5%) UPTO BIDDING 2015 to 2017	567.1	
A10	CONTINGENCY (2.8%)	170.8	
	TOTAL CIVIL WORK COST (A-2)	6,270.2	
	CONSTRUCTION COST PER KM	2,436.9	
(B) GOV	ERNMENT COST		
B1	RELOCATION OF UTILITIES	4.4	
B2	LAND ACQUISITION AND RESETTLEMENT	198.8	
В3	ENVIRONMENTAL MANAGEMENT MEASURES	12.8	
	TOTAL OF (B)	216.0	
	TOTAL COST OF (A) + (B)	6,486.3	
	ER COST		
C1	CONSTRUCTION SUPERVISION CHARGE (3 %)	188.1	
C2	QUALITY CONTROL CHARGE (0.25%)	15.7	
C3	ROAD SAFTY AUDIT CHARGE (0.25%)	15.7	
C4	MAINTENANCE FOR 4 YEARS (1.5% + 2.0% x 3 = 7.5%	470.3	
C5	ESCALATION (15%)	940.5	
C6	AGENCY(NHIDCL) CHARGE (3 %)	188.1	
	TOTAL OF (C)	1,818.4	
	TOTAL PROJECT COST (A) + (B) + (C)	8,304.6	
	CONSTRUCTION COST PER KM	3,227.6	

REAK	DOWN OF CONSTRUCTION COST	1	L=	2.6 k
S. NO.	DESCRIPTION	Q'TY	UNIT	AMOUNT (Rs)
A) CON	STRUCTION COST			
A1	SITE CLEARANCE			279,5
	A1.1 Clearing and Grubbing	4.63	hectare	198,4
	A1.2 Dismantling of Structures A1.3 Cutting of Trees	60	LS each	13,4 67,6
A2	EARTHWORK	00	cucii	86,399,7
	A2.1 Excavation in Soil	24,039	cum	6,012,1
	A2.2 Excavation in Ordinary Rock	96,154	cum	33,951,9
	A2.3 Excavation in Hard Rock	0	cum	
	A2.4 Excavation for Structures in Soil	1,461	cum	128,5
	A2.5 Excavation for Structures in Ordinary Rock	5,844	cum	683,7
	A2.6 Excavation for Structures in Hard Rock	0	cum	
	A2.7 Embankment Construction	32,465	cum	6,817,6
	A2.8 Scarifying Existing Bituminous Surface	0	sqm	2.660.6
	A2.10 Speil Book	5,046	cum	2,669,3
4.2	A2.10 Spoil Bank PAVEMENT	3	each	36,136,3
A3	A3.1 Granular Sub-base	8,715	oum	146,566, 1 30,197,4
	A3.1 Granular Sub-base A3.2 Wet Mix Macadam	7,177	cum	25,112,3
	A3.3 Prime Coat	28,708	sqm	1,349,2
	A3.4 Tack Coat	28,492	sqm	598,3
	A3.5 Dense Graded Bituminous Macadam	2,849	cum	41,507,0
	A3.6 Bituminous Concrete	1,136	cum	18,497,4
	A3.7 Surface Dressing	0	sqm	
	A3.8 Carriage of Materials	1	LS	29,304,1
A4	DRAINAGE			26,963,3
	A4.1 Lined Ditch 300 mm	2,733	metre	6,545,5
	A4.2 Sub Surface Drain with Perforated Pipe	0	metre	
	A4.3 Pipe Culvert 1,200 mm (Type-A)	8	each	9,124,5
	A4.4 Pipe Culvert 1,200 mm (Type-B)	11	each	8,330,7
	A4.5 Box Culvert 2 m x 2 m	1	each	2,962,4
	A4.6 Box Culvert 3 m x 3 m	0	each	
	A4.7 Box Culvert 4 m x 4 m	0	each	
	A4.8 Box Culvert 4 m x 6 m	0	each	
A5	BRIDGE	0	1.0	
1.0	A5.1 Bridge	0	LS	200 000 2
A6	SLOPE PROTECTION A6.1 Wet Masonry Retaining Wall (H=3m)	1,040		280,909,2
	A6.1 Wet Masonry Retaining Wall (H=5iii) A6.2 Wet Masonry Retaining Wall (H=7m)	880	metre	17,937,9 55,614,2
	A6.3 Gravity Wall (H=1.5m)	140	metre	2,793,1
	A6.4 Gravity Wall (H=2m)	120	metre metre	3,192,1
	A6.5 Gravity Wall (H=3m)	280	metre	11,172,5
	A6.6 Gravity Wall (H=4m)	280	metre	14,896,7
	A6.7 Gravity Wall (H=5m)	200	metre	13,300,6
	A6.8 Gravity Wall (H=6m)	200	metre	15,960,8
	A6.9 Reinforced Earth Retaining Wall (H=7m)	160	metre	30,172
	A6.10 Reinforced Earth Retaining Wall (H=8m)	140	metre	30,172,9
	A6.11 Reinforced Earth Retaining Wall (H=9m)	80	metre	19,396,9
	A6.12 Reinforced Earth Retaining Wall (H=10m)	60	metre	16,164,0
	A6.13 Reinforced Earth Retaining Wall (H=11m)	100	metre	29,634,
	A6.14 Reinforced Earth Retaining Wall (H=12m)	20	metre	6,465,6
	A6.15 Reinforced Earth Retaining Wall (H=13m)	40	metre	14,008,8
	A6.16 Reinforced Earth Retaining Wall (H=14m)	0	metre	
	A6.17 Reinforced Earth Retaining Wall (H=15m)	0	metre	
	A6.18 Gabion Wall (1:0.3)	0	cum	
	A6.19 Rockfall Prevention Wall (H=3m)	0	metre	
	A6.20 Rockfall Prevention Fence (H=2m)	0	metre	
	A6.21 Hydroseeding (t=5cm)	0	sqm	
	A6.22 Seeding and Mulching (Soil Cut Slope)	0	sqm	25.7
	A6.23 Turfing (Embankment)	281	sqm	25,2
	A6.24 Vegetation Mat (Steep Slope)	0	sqm	
	A6.25 Crib Work (F300) A6.26 Crib Work (F500)	0	sqm	
	A6.27 Non-frame	0	sqm sqm	
	A6.27 Non-frame A6.28 Earth Removal	0	sqm cum	
	A6.29 Counterweight Fill	0	cum	
	A6.30 Groundwater Drainage Work	0	metre	
	A6.31 Anchor Work	0	metre	
	A6.32 Rock-bolt Work	0	metre	
	A6.33 Landslide Prevention Work	0	LS	
A7	TRAFFIC SAFETY FACILITIES			12,051,9
	A7.1 Traffic Sign	1	LS	377,3
	A7.2 Road Marking	643	sqm	856,4
	A7.3 Road Delineator	132	each	640,3
	A7.4 Guard Rail	1,200	metre	7,742,
	A7.5 Street Furniture	1,650	each	2,435,
A8	ROAD APPURTENANCES	^		67,
	A8.1 Kilometer Stone (5km)	0	each	
	A8.2 Kilometer Stone (1km)	2	each	7,4
	A8.4 Roundam Stone (200m)	10	each	10,
	A8.4 Boundary Stone	52	each	49,9
	A8.5 Bus Bay and Road Amenity	0	each	
	A8.6 View Point TOTAL OF (A)	U	each	553,237,4
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A1.1 Clearing and Grubbing

SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
2.3	Clearing and Grubbing Road Land. (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)								
(ii)	By Mechanical Means								
A	In area of light jungle						hectare	34,923	0
В	In area of thorny jungle					4.63	hectare	42,856	198,423
					TOTAL	4.63	hectare		198,423

A1.2 Dismantling of Structures

A1.2	Dismantling of Structures								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)			(Rs)	(Rs)
A.1.2.1	Dismantling of Structures								
2.4	Dismantling of Structures (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)	I							
(i)	Lime /Cement Concrete								
II	By Mechanical Means for items No. 202(b) & (c)								
A	Cement Concrete Grade M-15 & M-20					1.52	cum	835	1,266
(iii)	Dismantling Stone Masonry								
В	Rubble stone masonry in cement mortar					20.99	cum	530	11,124
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			36.01	tonne.km	11.80	1,062
				SU	JB TOTAL				13,452
A.1.2.2	Dismantling of Flexible Pavemets								
2.5	Dismantling of Flexible Pavements (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)								
II	By Mechanical Means								
A	Bituminous course					0.00	cum	508	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0.00	tonne.km	11.80	0
		SUB TOTAL							0
					TOTAL	1	LS		13,452

A1.3 Cutting of Trees

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRII HON	(each)	(m)	(m)	(m)	QII	ONII	(Rs)	(Rs)
2.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)								
(i)	Girth from 300 mm to 600 mm					32	each	428	13,824
(ii)	Girth from 600 mm to 900 mm					20	each	778	15,232
(iii)	Girth from 900 mm to 1800 mm					6	each	4,277	27,021
(iv)	Girth above 1800 mm					1	each	8,555	11,595
					TOTAL	60	each		67,672

A2.1 Excavation in Soil

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Excavation in Hilly Areas in Ordinary Soil By Mechanical Means								
3.30	(Excavation in ordinary soil in hilly area by mechanical means including cutting								
3.30	and trimming of side slopes and disposing of excavated earth with all lifts and								
	lead)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					24,039	cum	197	4,735,683
	Case-II: Disposing cut material on the valley side						cum	90	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			43270	tonne.km	11.80	1,276,471
					TOTAL	24039	cum		6,012,154

A2.2 Excavation in Ordinary Rock

A2.2	Excavation in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
A.2.2.1	Excavation in Ordinary Rock not Requiring Blasting								
	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not								
3.31	Requiring Blasting. (Excavation in hilly area in ordinary rock not requiring								
3.31	ballasting by mechanical means including cutting and trimming of slopes and								
	disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					96,154	cum	300	28,846,200
	Case-II: Disposing cut material on the valley side						cum	155	0
	Loading and unloading of stone boulder/stone aggregates/sand/								
1.1	kanker/moorum. (Placing tipper at loading point, loading with front end loader,						cum	211	0
	dumping, turning for return trip, excluding time for haulage and return trip)								
	Cost of Haulage Excluding Loading and Unloading For Short Haul for a								
1.6	distance upto 100 km		Lead (km)						
(2)	*		2.5			152.055	. 1	11.00	5 105 777
(i)	Surfaced Road		2.5	CI	JB TOTAL	173,077	tonne.km	11.80	5,105,777
4 2 2 2	Encounting in Online on Deals Demaining Directors			50	BIUIAL	96,154	cum		33,951,977
A.2.2.2	Excavation in Ordinary Rock Requiring Blasting								
	Excavation in Hilly Areas in laminated rock (requiring blasting) By Mechanical								
	Means (Excavation for roadway in hilly areas in laminated rock (requiring								
3.32	blasting) which are not suitable for construction of masonry and pavement by								
3.32	drilling, blasting and breaking, trimming of bottom and side slopes in accordance								
	with requirements of lines, grades and cross sections, loading and disposal of cut								
	road with in all lifts and leads upto 1000 metres.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	392	0
	Case-II: Disposing cut material on the valley side						cum	290	0
	Loading and unloading of stone boulder/stone aggregates/sand/								_
1.1	kanker/moorum. (Placing tipper at loading point, loading with front end loader,						cum	211	0
	dumping, turning for return trip, excluding time for haulage and return trip)								
	Cost of Haulage Excluding Loading and Unloading For Short Haul for a								
1.6	distance upto 100 km		Lead (km)						
(3)	*		2.5				4 1	11.00	0
(i)	Surfaced Road		2.5	ei.	JB TOTAL	0	tonne.km	11.80	0
		TOTAL					cum		33,951,977
					IUIAL	96,154	Cum	l .	33,731,977

A2.3 Excavation in Hard Rock

A2.3	Excavation in Hard Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
3.33	Excavation in Hilly Areas in Hard Rock Requiring Blasting (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	556	0
	Case-II: Disposing cut material on the valley side						cum	411	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0	tonne.km	11.80	0
					TOTAL	0	cum		0
A2.4	Excavation for Structures in Soil								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRII TION	(each)	(m)	(m)	(m)	QII	ONII	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(i)	Ordinary soil		1						
В	Mechanical Means (Depth upto 3 m)					1461	cum	88	128,568
					TOTAL	1461	cum		128,568
A2.5	Excavation for Structures in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	ŲII	UNII	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(ii)	Ordinary rock (not requiring blasting)								
В	Mechanical Means					5,844	cum	117	683,748
					TOTAL	5,844			683,748

A2.6	Excavation for Structures in Hard Rock								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(iii)	Hard rock (requiring blasting)								
A	Manual Means					0	cum	999	(
					TOTAL	0	cum		(
A2.7	Embankment Construction		1						
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.15	Construction of Embankment with Material Deposited from Roadway Cutting (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2)					32,465	cum	210	6,817,650
					TOTAL	32,465	cum		6,817,650
A2.8	Scarifying Existing Bituminous Surface								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.13	Scarifying existing bituminous surface to a depth of 50 mm by mechanical means (Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.)					0	sqm	21	(
					TOTAL	0	sqm		(
A2.9	Subgrade								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.16	Construction of Subgrade and Earthen Shoulders (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2)					5,046	cum	529	2,669,334

2,669,334

A3.1	Granular Sub-bas	

A3.1	Granular Sub-base								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRI HOW	(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
4.1	Granular Sub-base with Close Graded Material (Table:- 400-1)								
A	Plant Mix Method (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401)								
(i)	for grading- I Material						cum	3,391	0
(ii)	for grading- II Material					8,715	cum	3,465	30,197,475
(iii)	for grading-III Material						cum	3,359	0
					TOTAL	8,715	cum	· ·	30,197,475
A3.2	Wet Mix Macadam				'		<u> </u>		
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	OPTV	LIMIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
4.11	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)					7,177	cum	3,499	25,112,323
					TOTAL	7,177	cum		25,112,323
A3.3	Prime Coat								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
5.1	Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate shown in 500-1 using mechanical means.)								
	i) Low Porosity					28,708	sqm	47	1,349,276
					TOTAL	28,708	sqm		1,349,276
A3.4	Tack Coat				'		-		
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
5.2	Tack coat (Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)	, ,	, ,	` ,	, ,			, ,	, ,
i)	Normal Bituminous Surface					28,492	sqm	21	598,332
iii)	Granular Surface Treated with Primer				mom/-		sqm	28	0
					TOTAL	28,492	sqm		598,332

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A3.5	Dense	Graded	Bituminous	Macadam

	Dense Graded Bituminous Macadam								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
5.4	Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)								
(ii)	for Grading II (19 mm nominal size)					2,849	cum	14,569	41,507,081
<u> </u>					TOTAL	2,849	cum		41,507,081
	Bituminous Concrete								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRI TION	(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
5.5	Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)								
	Case-I Using Bitumen 60/70 grade								
(i)	for Grading-I (13 mm nominal size)					1,136		16,283	18,497,488
					TOTAL	1,136	cum		18,497,488
	Surface Dressing		1			1			
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)		- 1	(Rs)	(Rs)
5.6	Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller)								
	Case-I: 19 mm nominal chipping size					0			0
				-	TOTAL	0	sqm		0

A3.8 Carriage of Materials

	iii) Lime/Fille		1,136	0.02	23	cum	1,784.33	40,540
	ii) Sand		1,136	0.45	511	cum	1,026.87	524,934
	i) Aggregate		1,136	1.46	1,659	cum	1,011.06	1,676,911
-	Cost of Haulage for Bituminous Concrete							
	iv) Bitumen		2,849	0.1	285	tonne	1,516.00	431,908
	iii) Lime/Fille		2,849	0.02	57	cum	1,784.33	101,671
	ii) Sand		2,849	0.45	1,282	cum	1,026.87	1,316,493
	i) Aggregate		2,849	1.44	4,103	cum	1,011.06	4,147,951
-	Cost of Haulage for Dense Graded Bituminous Macadam							
	iv) Bitumen					tonne	1,516.00	0
	iii) Lime/Fille					cum	1,784.33	0
	ii) Sand					cum	1,026.87	0
	i) Aggregate		7,177	1.32	9,474	cum	1,011.06	9,578,458
-	Cost of Haulage for Wet Mix Macadam							
	iv) Bitumen					tonne	1,516.00	0
	iii) Lime/Fille					cum	1,784.33	0
	ii) Sand					cum	1,026.87	0
	i) Aggregate		8,715	1.28	11,155	cum	1,011.06	11,278,623
-	Cost of Haulage for Granular Sub-base			•	`		\ ''	
NO.	DESCRIPTION		Q'TY	Q'TY	E O'TY	UNIT	(Rs)	(Rs)
SOR.	D.T.G.GD.YDWY.O.V.		WORK	UNIT	CARRIAG		RATE	AMOUNT

A7.1	Traffic	Sign
------	---------	------

A/.1	Tranic Sign								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRII HON	(each)	(m)	(m)	(m)	QII	OIVII	(Rs)	(Rs)
	Retro- reflectorised Traffic signs (Providing and fixing of retro- reflectorised								
	cautionary, mandatory and informatory sign as per IRC :67 made of								
	encapsulated lens type reflective sheeting vide clause 801.3, fixed over								
8.4	aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75								
	mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed								
	foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm								
	below ground level as per approved drawing)								
(i)	90 cm equilateral triangle					19	each	11,171	212,249
(ii)	60 cm equilateral triangle					0	each	6,901	(
(iii)	60 cm circular					4	each	9,696	38,784
(iv)	80 mm x 60 mm rectangular					9	each	14,032	126,288
(v)	60 cm x 45 cm rectangular					0	each	9,410	0
(vi)	60 cm x 60 cm square					0	each	11,391	0
					TOTAL	32	each		377,321
A7.2	Road Marking		,						
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	`		(Rs)	(Rs)
	Road Marking with Hot Applied Thermoplastic Compound with								
	Reflectorising Glass Beads on Bituminous Surface (Providing and laying of								
8.13	hot applied thermoplastic compound 2.5 mm thick including reflectorising glass					643	sqm	1,332	856,476
	beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface						- 4	-,	
	applied glass beads as per IRC:35 .The finished surface to be level, uniform and								
	free from streaks and holes.)								
					TOTAL	643	sqm		856,470
A7.3	Road Delineator		,						
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	.		(Rs)	(Rs)
	Road Delineators (Supplying and installation of delineators (road way								
0.15	indicators, hazard markers, object markers), 80-100 cm high above ground level,					100		4.051	C 40 222
8.15	painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm					132	each	4,851	640,332
	rectangular or 75 mm dia circular reflectorised panels at the top, buried or								
	pressed into the ground and confirming toIRC-79 and the drawings.)			l	TOTAL T	100			(40.222
					TOTAL	132	each	1	640,332

A7.4 Guard Rail

A7.4	Guard Rail								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
8.23	Metal Beam Crash Barrier	(cucii)	(111)	(111)	(111)			(113)	(Its)
A	Type - A, "W": Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810)					1,200	metre	6,452	7,742,400
					TOTAL	1,200	metre		7,742,400
A7.5	Street Furniture								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT

SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
8.35	Road Markers/Road Stud with Lense Rellector (Providing and Ixing of roac stud 100x 100 mm, die cast in aluminium, resistant to corrosive effect of salt and orit fitted with lense reflectors, installed in concrete or asphaltic surface by			` ,		1,650	each	1,476	2,435,400
					TOTAL	1,650	each		2,435,400

A8.1	Kilometer Stone (5km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	***	(each)	(m)	(m)	(m)	QTi	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of			ı					
8.14	standard design as per IRC:8-1980, fixing in position including painting and			l					
	printing etc)			ļ					
(i)	5th kilometre stone (precast)			1		0	each	6,147	0
					TOTAL	0	each		0
A8.2	Kilometer Stone (1km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TV	LIMIT	RATE	AMOUNT
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of				1	Q'TY	UNIT		
	***				1	Q'TY	UNIT		
NO. 8.14	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of				1	Q'TY	UNIT	(Rs)	(Rs)
NO.	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of standard design as per IRC:8-1980, fixing in position including painting and				1	Q'TY 2	UNIT		

	printing etc)								
(ii)	Ordinary Kilometer stone (Precast)					2	each	3,701	7,402
		TOTAL			2	each		7,402	
A8.3	Kilometer Stone (200m)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(iii)	Hectometer stone (Precast)					10	each	1,019	10,190
					TOTAL	10	each		10,190

A8.4	Boundary Stone								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIFTION	(each)	(m)	(m)	(m)	ŲII	UNII	(Rs)	(Rs)
8.16	Boundary pillar (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)					52	each	961	49,972
					TOTAL	52	each		49,972

						Rs)		st (in R ılage in		Mult	iplying Fact	or For		Lead in km			
SI.No.	Name of Materials	Unit	Truck Capacity Per Trip	Multiplying Factor	Net Payable Quantity	Cost of Loading and Unloading (In Rs)	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Surface Road = (8/Col. 6)xCol.8	Unsurfaced Road = (8/Col. 6) x Col. 9	Katcha Track & Track in River Bed/Nalah Bed & Choe Bed =(8/Col. 6) x Col. 10	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Cost of Carriage (In Rs) = $[(H_s.L_s+H_u.L_u+H_k.L_k) + Col. 7]$	Remarks
										H_s	H _u	H_k	L_s	L _u	L _k		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
01	Local Sand (Fine)	m ³	6	0.8	4.80	211	11.8	13.5	18.4	19.67	22.50	30.67	40	2	0	1042.67	
09	Coarse Sand	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	40	2	0	1011.06	1
01	Lime	m³	6	1	6	211	11.8	13.5	18.4	15.73	18.00	24.53	100	0	0	1784.33	Rs Per M ³
07	Stone Chips, Stone Aggregate 50mm & down	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	40	2	0	1011.06	
12	Bitumen Barauni	МТ	8	1	8	336	11.8	13.5	18.4	11.80	13.5	18.4	100	0	0	1516.00	Rs Per MT

Note: This calculation sheet was derived from cost estimate of DPR (NH54 Section 2)
Lead distances were revised by JICA Study Team for Bypass

ABSTRACT OF COST ESTIMATE

S. NO.	DESCRIPTION	AMOUNT	SHARE
(1) 003	COMPANION COOR	(Rs, Lac)	
` /	STRUCTION COST	10.1	0.070
A1	SITE CLEARANCE	13.1	0.05%
A2	EARTHWORK	5,022.2	19.60%
A3	PAVEMENT	6,670.6	26.04%
A4	DRAINAGE	1,513.0	5.91%
A5	BRIDGE	251.9	0.98%
A6	SLOPE PROTECTION	11,731.7	45.79%
A7	TRAFFIC SAFETY FACILITIES	415.0	1.62%
A8	ROAD APPURTENANCES	3.2	0.01%
	TOTAL OF (A-1)	25,620.7	100%
	CONSTRUCTION COST PER KM	2,170.3	
A9	ESCALATION (5%) UPTO BIDDING 2015 to 2017	2,626.1	
A10	CONTINGENCY (2.8%)	790.9	
	TOTAL CIVIL WORK COST (A-2)	29,037.8	
	CONSTRUCTION COST PER KM	2,459.8	
(B) GOV	ERNMENT COST		
B1	RELOCATION OF UTILITIES	3.7	
B2	LAND ACQUISITION AND RESETTLEMENT	980.4	
В3	ENVIRONMENTAL MANAGEMENT MEASURES	58.9	
	TOTAL OF (B)	1,043.0	
	TOTAL COST OF $(A) + (B)$	30,080.8	
(C) OTH	ER COST		
C1	CONSTRUCTION SUPERVISION CHARGE (3 %)	871.1	
C2	QUALITY CONTROL CHARGE (0.25%)	72.6	
C3	ROAD SAFTY AUDIT CHARGE (0.25%)	72.6	
C4	MAINTENANCE FOR 4 YEARS (1.5% + 2.0% x 3 = 7.5%	2,177.8	
C5	ESCALATION (15%)	4,355.7	
C6	AGENCY(NHIDCL) CHARGE (3 %)	871.1	
	TOTAL OF (C)	8,421.0	
	TOTAL PROJECT COST (A) + (B) + (C)	38,501.8	
	CONSTRUCTION COST PER KM	3,261.5	

BREAK	DOWN OF CONSTRUCTION COST	ı	L=	11.8 km
S. NO.	DESCRIPTION	Q'TY	UNIT	AMOUNT (Rs)
	STRUCTION COST SITE CLEARANCE			1 212 (10
A1	A1.1 Clearing and Grubbing	23.14	hectare	1,313,618 991,688
	A1.2 Dismantling of Structures	1	LS	11,449
	A1.3 Cutting of Trees	273	each	310,481
A2	EARTHWORK A2.1 Excavation in Soil	142 220		502,219,302
	A2.1 Excavation in Soil A2.2 Excavation in Ordinary Rock	142,230 533,364	cum	35,571,723 188,330,828
	A2.3 Excavation in Hard Rock	35,558	cum	21,658,378
	A2.4 Excavation for Structures in Soil	6,523	cum	574,024
	A2.5 Excavation for Structures in Ordinary Rock	24,462	cum	2,862,054
	A2.6 Excavation for Structures in Hard Rock	1,631	cum	1,629,369
	A2.7 Embankment Construction A2.8 Scarifying Existing Bituminous Surface	167,084 0	cum	35,087,640
	A2.9 Subgrade	21,001	sqm cum	11,109,529
	A2.10 Spoil Bank	13	each	205,395,757
A3	PAVEMENT			667,060,208
	A3.1 Granular Sub-base	41,341	cum	143,246,565
	A3.2 Wet Mix Macadam	33,965	cum	118,843,535
	A3.3 Prime Coat A3.4 Tack Coat	135,862 134,630	sqm	6,385,514 2,827,230
	A3.5 Dense Graded Bituminous Macadam	13,463	sqm cum	196,142,447
	A3.6 Bituminous Concrete	5,367	cum	87,390,861
	A3.7 Surface Dressing	0	sqm	0
	A3.8 Carriage of Materials	1	LS	112,224,056
A4	DRAINAGE	12.425		151,303,350
	A4.1 Lined Ditch 300 mm A4.2 Sub Surface Drain with Perforated Pipe	13,425	metre metre	31,293,675
	A4.2 Sub Surface Drain with Terrorated Tipe A4.3 Pipe Culvert 1,200 mm (Type-A)	31	each	34,697,587
	A4.4 Pipe Culvert 1,200 mm (Type-B)	47	each	35,135,320
	A4.5 Box Culvert 2 m x 2 m	8	each	23,264,280
	A4.6 Box Culvert 3 m x 3 m	2	each	8,525,170
	A4.7 Box Culvert 4 m x 4 m	3	each	18,387,318
A5	A4.8 Box Culvert 4 m x 6 m BRIDGE	0	each	25,190,795
AS	A5.1 Bridge (BP-2 4+530)	1	LS	25,190,795
	A5.2 Bridge (BP-2 10+800)	1	LS	357,108,178
A6	SLOPE PROTECTION			1,173,169,214
	A6.1 Wet Masonry Retaining Wall (H=3m)	3,920	metre	65,601,200
	A6.2 Wet Masonry Retaining Wall (H=7m)	5,880	metre	359,950,080
	A6.3 Gravity Wall (H=1.5m)	260	metre	5,010,460
	A6.4 Gravity Wall (H=2m) A6.5 Gravity Wall (H=3m)	560 880	metre metre	14,389,013 33,916,960
	A6.6 Gravity Wall (H=4m)	640	metre	32,889,173
	A6.7 Gravity Wall (H=5m)	920	metre	59,097,733
	A6.8 Gravity Wall (H=6m)	1,540	metre	118,709,360
	A6.9 Reinforced Earth Retaining Wall (H=7m)	560	metre	105,605,447
	A6.10 Reinforced Earth Retaining Wall (H=8m)	480	metre	103,450,234
	A6.11 Reinforced Earth Retaining Wall (H=9m) A6.12 Reinforced Earth Retaining Wall (H=10m)	360 280	metre metre	87,286,135 75,432,462
	A6.13 Reinforced Earth Retaining Wall (H=11m)	140	metre	41,487,854
	A6.14 Reinforced Earth Retaining Wall (H=12m)	140	metre	45,259,477
	A6.15 Reinforced Earth Retaining Wall (H=13m)	40	metre	14,008,886
	A6.16 Reinforced Earth Retaining Wall (H=14m)	0	metre	0
	A6.17 Reinforced Earth Retaining Wall (H=15m)	20	metre	9,698,459
	A6.18 Gabion Wall (1:0.3)	0	cum	0
	A6.19 Rockfall Prevention Wall (H=3m) A6.20 Rockfall Prevention Fence (H=2m)	0	metre metre	0
	A6.21 Hydroseeding (t=5cm)	0	sqm	0
	A6.22 Seeding and Mulching (Soil Cut Slope)	0	sqm	0
	A6.23 Turfing (Embankment)	15,292	sqm	1,376,280
	A6.24 Vegetation Mat (Steep Slope)	0	sqm	0
	A6.25 Crib Work (F300)	0	sqm	0
	A6.26 Crib Work (F500) A6.27 Non-frame	0	sqm	0
	A6.28 Earth Removal	0	sqm cum	0
	A6.29 Counterweight Fill	0	cum	0
	A6.30 Groundwater Drainage Work	0	metre	0
	A6.31 Anchor Work	0	metre	0
	A6.32 Rock-bolt Work	0	metre	0
	A6.33 Landslide Prevention Work	0	LS	0
A7	TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign	1	LS	41,495,215 1,010,578
	A7.1 Harne Sign A7.2 Road Marking	2,951	sqm	3,930,732
	A7.2 Road Marking A7.3 Road Delineator	1,155	each	5,602,905
	A7.4 Guard Rail	3,150	metre	20,323,800
	A7.5 Street Furniture	7,200	each	10,627,200
A8	ROAD APPURTENANCES			321,311
	A8.1 Kilometer Stone (5km)	2	each	12,294
	A8.2 Kilometer Stone (1km)	9 48	each each	33,309 48,912
	A8.3 Kilometer Stone (200m) A8.4 Boundary Stone	236	each each	48,912 226,796
	A8.5 Bus Bay and Road Amenity	0	each	0
	A8.6 View Point	0	each	0
-	TOTAL OF (A)			2,562,073,013
	CONSTRUCTION COST PER KM			217,032,868

A1.1 Clearing and Grubbing

SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
2.3	Clearing and Grubbing Road Land. (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)								
(ii)	By Mechanical Means								
A	In area of light jungle						hectare	34,923	0
В	In area of thorny jungle					23.14	hectare	42,856	991,688
	TOTAL				TOTAL	23.14	hectare		991,688

A1.2 Dismantling of Structures

	Dismantling of Structures								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
A.1.2.1	Dismantling of Structures								
	Dismantling of Structures (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)	I							
	Lime /Cement Concrete								
II	By Mechanical Means for items No. 202(b) & (c)								
A	Cement Concrete Grade M-15 & M-20					1.29	cum	835	1,077
	Dismantling Stone Masonry								
В	Rubble stone masonry in cement mortar					17.86	cum	530	9,467
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			30.64	tonne.km	11.80	904
				SU	JB TOTAL				11,449
A.1.2.2	Dismantling of Flexible Pavemets								
2.5	Dismantling of Flexible Pavements (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)								
II	By Mechanical Means								
A	Bituminous course					0.00	cum	508	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0.00	tonne.km	11.80	0
		SUB TOTA							0
		TOTA				1	LS		11,449

A1.3 Cutting of Trees

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	01411	(Rs)	(Rs)
2.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)								
(i)	Girth from 300 mm to 600 mm					148	each	428	63,423
(ii)	Girth from 600 mm to 900 mm					90	each	778	69,887
(iii)	Girth from 900 mm to 1800 mm					29	each	4,277	123,975
(iv)	Girth above 1800 mm					6	each	8,555	53,197
					TOTAL	273	each		310,481

A2.1 Excavation in Soil

SOR.		NO.	LENGTH	WIDTH	HEIGHT			RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
	Excavation in Hilly Areas in Ordinary Soil By Mechanical Means			` '	` ´			` ′	` '
3.30	(Excavation in ordinary soil in hilly area by mechanical means including cutting								
3.30	and trimming of side slopes and disposing of excavated earth with all lifts and								
	lead)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					142,230	cum	197	28,019,310
	Case-II: Disposing cut material on the valley side						cum	90	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			256014	tonne.km	11.80	7,552,413
					TOTAL	142230	cum		35,571,723

A2.2 Excavation in Ordinary Rock

A2.2	Excavation in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	ONII	(Rs)	(Rs)
A.2.2.1	Excavation in Ordinary Rock not Requiring Blasting								
3.31	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting. (Excavation in hilly area in ordinary rock not requiring ballasting by mechanical means including cutting and trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					533,364	cum	300	160,009,200
	Case-II: Disposing cut material on the valley side						cum	155	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip) Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)				cum	211	0
	-								
(i)	Surfaced Road		2.5			960,055	tonne.km	11.80	28,321,628
				SU	JB TOTAL	533,364	cum		188,330,828
A.2.2.2	Excavation in Ordinary Rock Requiring Blasting								
3.32	Excavation in Hilly Areas in laminated rock (requiring blasting) By Mechanical Means (Excavation for roadway in hilly areas in laminated rock (requiring blasting) which are not suitable for construction of masonry and pavement by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	392	0
	Case-II: Disposing cut material on the valley side						cum	290	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0	tonne.km	11.80	0
				SU	JB TOTAL	0	cum		0
1					TOTAL	533,364	cum		188,330,828

A2.3 Excavation in Hard Rock

A4.3	Excavation in Haru Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
3.33	Excavation in Hilly Areas in Hard Rock Requiring Blasting (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					35,558	cum	556	19,770,248
	Case-II: Disposing cut material on the valley side					,	cum	411	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			64,004	tonne.km	11.80	1,888,130
					TOTAL	35,558	cum		21,658,378
A2.4	Excavation for Structures in Soil								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	=======================================	(each)	(m)	(m)	(m)	· · ·		(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(i)	Ordinary soil								
В	Mechanical Means (Depth upto 3 m)					6523	cum	88	574,024
					TOTAL	6523	cum		574,024
A2.5	Excavation for Structures in Ordinary Rock		T						
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	`		(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(ii)	Ordinary rock (not requiring blasting)								
В	Mechanical Means					24,462	cum	117	2,862,054
					TOTAL	24,462	cum		2,862,054

SOR.	Excavation for Structures in Hard Rock	NO.	LENGTH	WIDTH	HEIGHT			RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)	(cucii)	(m)	(iii)	(iii)			(10)	(RS)
(iii)	Hard rock (requiring blasting)								
A	Manual Means					1,631	cum	999	1,629,369
					TOTAL	1,631	cum		1,629,369
A2.7	Embankment Construction		1		r 1				
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.15	Construction of Embankment with Material Deposited from Roadway Cutting (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2)					167,084	cum	210	35,087,640
					TOTAL	167,084	cum		35,087,640
A2.8	Scarifying Existing Bituminous Surface								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.13	Scarifying existing bituminous surface to a depth of 50 mm by mechanical means (Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.)					0	sqm	21	(
					TOTAL	0	sqm		
A2.9	Subgrade								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.16	Construction of Subgrade and Earthen Shoulders (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2)					21,001	cum	529	11,109,529

TOTAL

cum

11,109,529

A3.1	Granular	Crub boco

A3.1	Granuar Sub-base								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
4.1	Granular Sub-base with Close Graded Material (Table:- 400-1)								
A	Plant Mix Method (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 401)								
(i)	for grading- I Material		+				cum	3,391	0
(ii)	for grading- II Material		1			41.341	cum	3,465	143,246,565
(iii)	for grading-III Material		+			41,541	cum	3,359	143,240,303
(111)	for grading-tit. Material				TOTAL	41,341	cum	3,337	143,246,565
A3.2	Wet Mix Macadam				TOTAL	41,341	cum	I	143,240,303
SOR.		NO.	LENGTH	WIDTH	HEIGHT			RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
NO.	77 . 76 . 76 . 10 . 11 . 1	(eacii)	(111)	(III)	(111)			(KS)	(KS)
4.11	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)					33,965	cum	3,499	118,843,535
					TOTAL	33,965	cum		118,843,535
A3.3	Prime Coat								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
5.1	Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate shown in 500-1 using mechanical means.)								
	i) Low Porosity		†			135,862	sam	47	6,385,514
	17				TOTAL	135,862	sqm	.,	6,385,514
A3.4	Tack Coat				,	,		L	-,,
SOR.		NO.	LENGTH	WIDTH	HEIGHT			RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
5.2	Tack coat (Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)							, ,	, ,
i)	Normal Bituminous Surface					134,630	sqm	21	2,827,230
iii)	Granular Surface Treated with Primer						sqm	28	0
111)	Grandian Surface Treated with Trinici		1	'	TOTAL		sqiii	20	- 0

Δ35	Dense	Graded	Bituminous	Macadam

A3.5	Dense Graded Bituminous Macadam								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
5.4	Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.)								
(ii)	for Grading II (19 mm nominal size)					13,463	cum	14,569	196,142,447
					TOTAL	13,463	cum		196,142,447
	Bituminous Concrete								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRI TION	(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
5.5	Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)								
	Case-I Using Bitumen 60/70 grade								
(i)	for Grading-I (13 mm nominal size)					5,367	cum	16,283	87,390,861
					TOTAL	5,367	cum		87,390,861
	Surface Dressing	170	r myrom	** *** *** *** **	*******			D + mm	
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	`		(Rs)	(Rs)
5.6	Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller)								
	Case-I: 19 mm nominal chipping size					0	sqm		0
					TOTAL	0	sqm		0

A3.8 Carriage of Materials

A3.0	Carriage of Waterials						
SOR.	DESCRIPTION	WORK	UNIT	CARRIAG	UNIT	RATE	AMOUNT
NO.	DESCRIFTION	Q'TY	Q'TY	E Q'TY	UNII	(Rs)	(Rs)
-	Cost of Haulage for Granular Sub-base						
	i) Aggregate	41,341	1.28	52,916	cum	813.85	43,066,286
	ii) Sand				cum	825.76	0
	iii) Lime/Fille				cum	1,692.33	0
	iv) Bitumen				tonne	1,447.00	0
-	Cost of Haulage for Wet Mix Macadam						
	i) Aggregate	33,965	1.32	44,834	cum	813.85	36,488,165
	ii) Sand				cum	825.76	0
	iii) Lime/Fille				cum	1,692.33	0
	iv) Bitumen				tonne	1,447.00	0
-	Cost of Haulage for Dense Graded Bituminous Macadam						
	i) Aggregate	13,463	1.44	19,387	cum	813.85	15,777,958
	ii) Sand	13,463	0.45	6,058	cum	825.76	5,002,745
	iii) Lime/Fille	13,463	0.02	269	cum	1,692.33	455,678
	iv) Bitumen	13,463	0.1	1,346	tonne	1,447.00	1,948,096
-	Cost of Haulage for Bituminous Concrete						
	i) Aggregate	5,367	1.46	7,836	cum	813.85	6,377,213
	ii) Sand	5,367	0.45	2,415	cum	825.76	1,994,335
	iii) Lime/Fille	5,367	0.02	107	cum	1,692.33	181,655
	iv) Bitumen	5,367	0.12	644	tonne	1,447.00	931,926
			TOTAL	1	LS		112 224 056

A7.1	Traffic	Sign
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A/.1	France Sign								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
	Retro- reflectorised Traffic signs (Providing and fixing of retro- reflectorised								
	cautionary, mandatory and informatory sign as per IRC :67 made of								
	encapsulated lens type reflective sheeting vide clause 801.3, fixed over								
8.4	aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75								
	mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed								
	foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm								
	below ground level as per approved drawing)								
(i)	90 cm equilateral triangle					70	each	11,171	781,970
(ii)	60 cm equilateral triangle					0	each	6,901	0
(iii)	60 cm circular					12	each	9,696	116,352
(iv)	80 mm x 60 mm rectangular					8	each	14,032	112,256
(v)	60 cm x 45 cm rectangular					0	each	9,410	0
(vi)	60 cm x 60 cm square					0	each	11,391	0
					TOTAL	90	each		1,010,578
A7.2	Road Marking								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	(· · ·		(Rs)	(Rs)
	Road Marking with Hot Applied Thermoplastic Compound with								
	Reflectorising Glass Beads on Bituminous Surface (Providing and laying of								
8.13	hot applied thermoplastic compound 2.5 mm thick including reflectorising glass					2,951	sqm	1,332	3,930,732
0.13	beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface					2,751	sqiii	1,552	3,730,732
	applied glass beads as per IRC:35 .The finished surface to be level, uniform and								
	free from streaks and holes.)								
					TOTAL	2,951	sqm		3,930,732
A7.3	Road Delineator								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Road Delineators (Supplying and installation of delineators (road way								
	indicators, hazard markers, object markers), 80-100 cm high above ground level,								
8.15	painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm					1,155	each	4,851	5,602,905
	rectangular or 75 mm dia circular reflectorised panels at the top, buried or								
	pressed into the ground and confirming toIRC-79 and the drawings.)								
					TOTAL	1155	each		5,602,905

A7.4 Guard Rail

A7.4	Guard Rail								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
8.23	Metal Beam Crash Barrier		` /					` '	
A	Type - A, "W": Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section $150 \times 75 \times 5$ mm, 330 mm long complete as per clause 810)					3,150	metre	6,452	20,323,800
					TOTAL	3,150	metre		20,323,800
A7.5	Street Furniture								•
SOR.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Road Markers/Road Stud with Lense Reflector (Providing and fixing of road								
8.35	stud 100x 100 mm, die cast in aluminium, resistant to corrosive effect of salt and					7,200	each	1,476	10,627,200
	grit fitted with lense reflectors, installed in concrete or asphaltic surface by								
					TOTAL	7,200	each		10,627,200

A8.1	Kilometer Stone (5km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(i)	5th kilometre stone (precast)					2	each	6,147	12,294
					TOTAL	2	each		12,294
A8.2	Kilometer Stone (1km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(ii)	Ordinary Kilometer stone (Precast)					9	each	3,701	33,309
					TOTAL	9	each		33,309
A8.3	Kilometer Stone (200m)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(iii)	Hectometer stone (Precast)					48	each	1,019	48,912
					TOTAL	48	each		48,912

A0.4	Boundary Stone								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
8.16	Boundary pillar (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)					236	each	961	226,796
					TOTAL	236	each		226,796

						(\$)		st (in R ulage in		Mult	iplying Fact	or For		Lead in km	ı		
SI.No.	Name of Materials	Unit	Truck Capacity Per Trip	Multiplying Factor	Net Payable Quantity	Cost of Loading and Unloading (In Rs)	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Surface Road = (8/Col. 6)xCol. 8	Unsurfaced Road = (8/Col. 6) x Col. 9	Katcha Track & Track in River Bed/Nalah Bed & Choe Bed =(8/Col. 6) x Col. 10	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Cost of Carriage (In Rs) $= [(H_s.L_s + H_u.L_u + H_k.L_k) + Col. 7]$	Remarks
										H _s	H _u	H _k	L _s	L _u	L_k		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
01	Local Sand (Fine)	m ³	6	0.8	4.80	211	11.8	13.5	18.4	19.67	22.50	30.67	25	6	0	837.67	
09	Coarse Sand	m ³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	25	6	0	813.85	1
01	Lime	m ³	6	1	6	211	10.1	11.9	16.2	13.47	15.85	21.60	110	0	0	1692.33	Rs Per M ³
07	Stone Chips, Stone Aggregate 50mm & down	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	25	6	0	813.85	
12	Bitumen Barauni	MT	8	1	8	336	10.1	11.9	16.2	10.10	11.89	16.2	110	0	0	1447.00	Rs Per MT

Note: This calculation sheet was derived from cost estimate of DPR (NH54 Section 2)
Lead distances were revised by JICA Study Team for Bypass

ABSTRACT OF COST ESTIMATE

S. NO.	DESCRIPTION	AMOUNT (Pag. Lag)	SHARE
(A) CON	STRUCTION COST	(Rs, Lac)	
A1	SITE CLEARANCE	7.5	0.05%
A2	EARTHWORK	2,475.8	16.33%
A3	PAVEMENT	4,894.1	32.28%
A4	DRAINAGE	1,264.5	8.34%
A5	BRIDGE	0.0	0.00%
A6	SLOPE PROTECTION	6,318.5	41.68%
A7	TRAFFIC SAFETY FACILITIES	197.8	1.30%
A8	ROAD APPURTENANCES	1.9	0.01%
	TOTAL OF (A-1)	15,160.3	100%
	CONSTRUCTION COST PER KM	2,158.0	
A9	ESCALATION (5%) UPTO BIDDING 2015 to 2017	1,553.9	
A10	CONTINGENCY (2.8%)	468.0	
	TOTAL CIVIL WORK COST (A-2)	17,182.2	
	CONSTRUCTION COST PER KM	2,445.9	
(B) GOV	ERNMENT COST		
B1	RELOCATION OF UTILITIES	0.9	
B2	LAND ACQUISITION AND RESETTLEMENT	557.5	
В3	ENVIRONMENTAL MANAGEMENT MEASURES	35.1	
	TOTAL OF (B)	593.5	
	$TOTAL\ COST\ OF\ (A)+(B)$	17,775.7	
(C) OTH	ER COST		
C1	CONSTRUCTION SUPERVISION CHARGE (3 %)	515.5	
C2	QUALITY CONTROL CHARGE (0.25%)	43.0	
C3	ROAD SAFTY AUDIT CHARGE (0.25%)	43.0	
C4	MAINTENANCE FOR 4 YEARS $(1.5\% + 2.0\% \times 3 = 7.5\%)$	1,288.7	
C5	ESCALATION (15%)	2,577.3	
C6	AGENCY(NHIDCL) CHARGE (3 %)	515.5	
	TOTAL OF (C)	4,982.8	
	TOTAL PROJECT COST $(A) + (B) + (C)$	22,758.5	
	CONSTRUCTION COST PER KM	3,239.6	

	DOWN OF CONSTRUCTION COST	Τ	L=	7.0 km
S. NO.	DESCRIPTION	Q'TY	UNIT	AMOUNT (Rs)
	STRUCTION COST			740.00
A1	SITE CLEARANCE A1.1 Clearing and Grubbing	13.05	hectare	748,08 559,27
	A1.2 Dismantling of Structures	1	LS	4,05
	A1.3 Cutting of Trees	163	each	184,76
A2	EARTHWORK A2.1 Excavation in Soil	108,196	cum	247,582,38 27,059,82
	A2.1 Excavation in Ordinary Rock	252,458	cum	89,142,92
	A2.3 Excavation in Hard Rock	0	cum	~,·,-,-
	A2.4 Excavation for Structures in Soil	5,655	cum	497,64
	A2.5 Excavation for Structures in Ordinary Rock A2.6 Excavation for Structures in Hard Rock	13,195	cum	1,543,81
	A2.6 Excavation for Structures in Hard Rock A2.7 Embankment Construction	0 76,906	cum	16,150,26
	A2.8 Scarifying Existing Bituminous Surface	0	sqm	10,130,20
	A2.9 Subgrade	12,602	cum	6,666,45
	A2.10 Spoil Bank	5	each	106,521,47
A3	PAVEMENT A3.1 Granular Sub-base	24,830	aum	489,413,72
	A3.1 Grandar Sub-base A3.2 Wet Mix Macadam	20,406	cum	86,035,95 71,400,59
	A3.3 Prime Coat	81,625	sqm	3,836,37
	A3.4 Tack Coat	80,901	sqm	1,698,92
	A3.5 Dense Graded Bituminous Macadam	8,090	cum	117,863,21
	A3.6 Bituminous Concrete	3,226	cum	52,528,95
	A3.7 Surface Dressing A3.8 Carriage of Materials	0	sqm LS	156,049,72
A4	DRAINAGE	1	Lo	126,451,86
	A4.1 Lined Ditch 300 mm	8,350	metre	22,553,35
	A4.2 Sub Surface Drain with Perforated Pipe	0	metre	-
	A4.3 Pipe Culvert 1,200 mm (Type-A)	16	each	20,397,05
	A4.4 Pipe Culvert 1,200 mm (Type-B) A4.5 Box Culvert 2 m x 2 m	24	each	19,962,74
	A4.6 Box Culvert 2 m x 2 m A4.6 Box Culvert 3 m x 3 m	12 5	each each	39,440,30 24,098,41
	A4.7 Box Culvert 4 m x 4 m	0	each	24,070,41
	A4.8 Box Culvert 4 m x 6 m	0	each	
A5	BRIDGE			
4.0	A5.1 Bridge	0	LS	(21 952 54
A6	SLOPE PROTECTION A6.1 Wet Masonry Retaining Wall (H=3m)	2,683	metre	631,853,74 52,745,09
	A6.2 Wet Masonry Retaining Wall (H=7m)	2,963	metre	214,793,79
	A6.3 Gravity Wall (H=1.5m)	160	metre	3,699,84
	A6.4 Gravity Wall (H=2m)	320	metre	9,866,24
	A6.5 Gravity Wall (H=3m)	693	metre	32,049,86
	A6.6 Gravity Wall (H=4m) A6.7 Gravity Wall (H=5m)	543 580	metre metre	33,483,55 44,706,40
	A6.8 Gravity Wall (H=6m)	780	metre	72,146,88
	A6.9 Reinforced Earth Retaining Wall (H=7m)	100	metre	18,858,11
	A6.10 Reinforced Earth Retaining Wall (H=8m)	200	metre	43,104,26
	A6.11 Reinforced Earth Retaining Wall (H=9m)	160	metre	38,793,83
	A6.12 Reinforced Earth Retaining Wall (H=10m) A6.13 Reinforced Earth Retaining Wall (H=11m)	180 40	metre metre	48,492,29 11,853,67
	A6.14 Reinforced Earth Retaining Wall (H=11m)	20	metre	6,465,64
	A6.15 Reinforced Earth Retaining Wall (H=13m)	0	metre	0,100,01
	A6.16 Reinforced Earth Retaining Wall (H=14m)	0	metre	
	A6.17 Reinforced Earth Retaining Wall (H=15m)	0	metre	
	A6.18 Gabion Wall (1:0.3)	0	cum	
	A6.19 Rockfall Prevention Wall (H=3m) A6.20 Rockfall Prevention Fence (H=2m)	0	metre metre	
	A6.21 Hydroseeding (t=5cm)	0	sqm	
	A6.22 Seeding and Mulching (Soil Cut Slope)	0	sqm	
-	A6.23 Turfing (Embankment)	8,825	sqm	794,25
	A6.24 Vegetation Mat (Steep Slope)	0	sqm	
	A6.25 Crib Work (F300) A6.26 Crib Work (F500)	0	sqm sqm	
	A6.27 Non-frame	0	sqm	
	A6.28 Earth Removal	0	cum	
	1	0	cum	
	A6.29 Counterweight Fill	-		
	A6.30 Groundwater Drainage Work	0	metre	
	A6.30 Groundwater Drainage Work A6.31 Anchor Work	0	metre	
	A6.30 Groundwater Drainage Work			
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES	0	metre metre LS	
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign	0 0 0	metre metre LS LS	19,783,25 502,61
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking	0 0 0 1 1,756	metre metre LS LS sqm	19,783,25 502,61 2,338,99
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator	0 0 0 1 1,756 801	metre LS LS sqm each	19,783,25 502,61 2,338,99 3,885,65
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail	0 0 0 1 1,756 801 1,200	metre Metre LS LS sqm each metre	19,783,25 502,61 2,338,99 3,885,65 7,742,40
A7	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator	0 0 0 1 1,756 801	metre LS LS sqm each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60
	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail A7.5 Street Furniture ROAD APPURTENANCES A8.1 Kilometer Stone (5km)	0 0 0 1 1,756 801 1,200 3,600	metre metre LS LS sqm each metre each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60 192,38 6,14
	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail A7.5 Street Furniture ROAD APPURTENANCES A8.1 Kilometer Stone (5km) A8.2 Kilometer Stone (1km)	0 0 0 1 1,756 801 1,200 3,600	metre metre LS LS sqm each metre each each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60 192,38 6,14 22,20
	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail A7.5 Street Furniture ROAD APPURTENANCES A8.1 Kilometer Stone (5km) A8.2 Kilometer Stone (1km) A8.3 Kilometer Stone (200m)	0 0 0 1 1,756 801 1,200 3,600	metre metre LS LS sqm each metre each each each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60 192,38 6,14 22,20 28,53
	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail A7.5 Street Furniture ROAD APPURTENANCES A8.1 Kilometer Stone (5km) A8.2 Kilometer Stone (1km) A8.3 Kilometer Stone (200m) A8.4 Boundary Stone	0 0 0 1 1,756 801 1,200 3,600	metre metre LS LS sqm each metre each each each each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60 192,38 6,14 22,20 28,53 135,50
	A6.30 Groundwater Drainage Work A6.31 Anchor Work A6.32 Rock-bolt Work A6.33 Landslide Prevention Work TRAFFIC SAFETY FACILITIES A7.1 Traffic Sign A7.2 Road Marking A7.3 Road Delineator A7.4 Guard Rail A7.5 Street Furniture ROAD APPURTENANCES A8.1 Kilometer Stone (5km) A8.2 Kilometer Stone (1km) A8.3 Kilometer Stone (200m)	0 0 0 1 1,756 801 1,200 3,600 1 6 28	metre metre LS LS sqm each metre each each each	19,783,25 502,61 2,338,99 3,885,65 7,742,40 5,313,60 192,38 6,14 22,20

UC (BP-3)

A1.1 Clearing and Grubbing

SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
2.3	Clearing and Grubbing Road Land. (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)								
(ii)	By Mechanical Means								
A	In area of light jungle						hectare	34,923	0
В	In area of thorny jungle					13.05	hectare	42,856	559,271
					TOTAL	13.05	hectare		559,271

A1.2 Dismantling of Structures

A1.2	Dismantling of Structures								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO. A.1.2.1	Dismantling of Structures	(each)	(m)	(m)	(m)	-		(Rs)	(Rs)
A.1.2.1									
2.4	Dismantling of Structures (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)	I							
(i)	Lime /Cement Concrete								
II	By Mechanical Means for items No. 202(b) & (c)								
A	Cement Concrete Grade M-15 & M-20					0.32	cum	835	269
(iii)	Dismantling Stone Masonry								
В	Rubble stone masonry in cement mortar					4.47	cum	530	2,367
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			7.66	tonne.km	11.80	226
				SU	JB TOTAL				2,862
A.1.2.2	Dismantling of Flexible Pavemets								
2.5	Dismantling of Flexible Pavements (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)								
II	By Mechanical Means								
A	Bituminous course					2.14	cum	508	1,088
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			3.43	tonne.km	11.80	101
				SU	JB TOTAL				1,189
					TOTAL	1	LS		4,051

A1.3 Cutting of Trees

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIFTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
2.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)								
(i)	Girth from 300 mm to 600 mm					88	each	428	37,742
(ii)	Girth from 600 mm to 900 mm					53	each	778	41,589
(iii)	Girth from 900 mm to 1800 mm					17	each	4,277	73,776
(iv)	Girth above 1800 mm					4	each	8,555	31,657
					TOTAL	163	each		184,763

A2.1 Excavation in Soil

A4.1	Excavation in Son								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Excavation in Hilly Areas in Ordinary Soil By Mechanical Means								
3.30	(Excavation in ordinary soil in hilly area by mechanical means including cutting								
5.50	and trimming of side slopes and disposing of excavated earth with all lifts and								
	lead)					100 101		405	21 21 1 112
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					108,196	cum	197	21,314,612
	Case-II: Disposing cut material on the valley side						cum	90	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			194753	tonne.km	11.80	5,745,208
					TOTAL	108196	cum		27,059,820

A2.2 Excavation in Ordinary Rock

A2.2	Excavation in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	OIVII	(Rs)	(Rs)
A.2.2.1	Excavation in Ordinary Rock not Requiring Blasting								
3.31	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting. (Excavation in hilly area in ordinary rock not requiring ballasting by mechanical means including cutting and trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					252,458	cum	300	75,737,400
	Case-II: Disposing cut material on the valley side						cum	155	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip) Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)				cum	211	0
	-								
(i)	Surfaced Road		2.5			454,424	tonne.km	11.80	13,405,520
			1	St	JB TOTAL	252,458	cum		89,142,920
A.2.2.2	Excavation in Ordinary Rock Requiring Blasting								
3.32	Excavation in Hilly Areas in laminated rock (requiring blasting) By Mechanical Means (Excavation for roadway in hilly areas in laminated rock (requiring blasting) which are not suitable for construction of masonry and pavement by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut road with in all lifts and leads upto 1000 metres.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	392	0
	Case-II: Disposing cut material on the valley side						cum	290	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0	tonne.km	11.80	0
				SU	JB TOTAL	0	cum		0
1					TOTAL	252,458	cum		89,142,920

A2.3 Excavation in Hard Rock

A2.3	Excavation in Hard Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Excavation in Hilly Areas in Hard Rock Requiring Blasting (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	556	0
	Case-II: Disposing cut material on the valley side						cum	411	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0	tonne.km	11.80	0
					TOTAL	0	cum		0
A2.4	Excavation for Structures in Soil								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	BBSSM 110.1	(each)	(m)	(m)	(m)	ų.,	0.111	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(i)	Ordinary soil								
В	Mechanical Means (Depth upto 3 m)					5655	cum	88	497,640
	`				TOTAL	5655	cum		497,640
A2.5	Excavation for Structures in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRI HON	(each)	(m)	(m)	(m)	QII	OIVII	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(ii)	Ordinary rock (not requiring blasting)								
В	Mechanical Means					13,195	cum	117	1,543,815
					TOTAL	13,195	cum		1,543,815

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	.		(Rs)	(Rs)
	Excavation for Structures (Earth work in excavation of foundation of								
	structures as per drawing and technical specification, including setting out,								
3.11	construction of shoring and bracing, removal of stumps and other deleterious								
	matter, dressing of sides and bottom, backfilling the excavation earth to the								
	extent required and utilising the remaining earth locally for road work.)								
(iii)	Hard rock (requiring blasting)								
A	Manual Means					0	cum	999	
					TOTAL	0	cum		
A2.7	Embankment Construction								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	01111	(Rs)	(Rs)
	Construction of Embankment with Material Deposited from Roadway								
	Cutting (Construction of embankment with approved materials deposited at site								
3.15	from roadway cutting and excavation from drain and foundation of other					76,906	cum	210	16,150,26
	structures graded and compacted to meet requirement of table 300-2)								
	,				momit				
120	G tet Did Di				TOTAL	76,906	cum		16,150,26
A2.8	Scarifying Existing Bituminous Surface	NO.	LENGTH	WIDTH	LUCIUT			DATE	AMOUNT
SOR. NO.	DESCRIPTION	NO. (each)			HEIGHT	Q'TY	UNIT	RATE (Rs)	AMOUNT
NO.		(eacn)	(m)	(m)	(m)			(KS)	(Rs)
	Scarifying existing bituminous surface to a depth of 50 mm by mechanical								
3.13	means (Scarifying the existing bituminous road surface to a depth of 50 mm and					0	sqm	21	
	disposal of scarified material with in all lifts and lead upto 1000 metres.)								
					TOTAL	0	sqm		
A2.9	Subgrade					0	sqm		
SOR.	Subgrade DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
	T V	NO. (each)	LENGTH (m)	WIDTH (m)				RATE (Rs)	
SOR.	T V				HEIGHT				
SOR. NO.	DESCRIPTION Construction of Subgrade and Earthen Shoulders (Construction of subgrade				HEIGHT	Q'TY	UNIT	(Rs)	(Rs)
SOR.	DESCRIPTION				HEIGHT				

TOTAL

cum

6,666,458

A3.1	Granular	Sub-base
COD		

COD	Granulai Sub-base	NO.	LENGTH	WIDTH	HEIGHT	-		RATE	AMOUNT
SOR. NO.	DESCRIPTION	NO. (each)			_	Q'TY	UNIT		
4.1	Consider Set Learnith Class Conded Material (Table 400.1)	(each)	(m)	(m)	(m)			(Rs)	(Rs)
4.1	Granular Sub-base with Close Graded Material (Table:- 400-1)								
	Plant Mix Method (Construction of granular sub-base by providing close								
	graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed								
A	Material to work site, spreading in uniform layers with motor grader on prepared								
	surface and compacting with vibratory power roller to achieve the desired								
	density, complete as per clause 401)								
(i)	for grading- I Material						cum	3,391	0
(ii)	for grading- II Material					24,830	cum	3,465	86,035,950
(iii)	for grading-III Material						cum	3,359	0
					TOTAL	24,830	cum		86,035,950
A3.2	Wet Mix Macadam								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	ONII	(Rs)	(Rs)
	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone								
	aggregate to wet mix macadam specification including premixing the Material								
	with water at OMC in mechanical mix plant carriage of mixed Material by tipper					20.104		2 400	#4 400 #04
4.11	to site, laying in uniform layers with paver in sub- base / base course on well					20,406	cum	3,499	71,400,594
	prepared surface and compacting with vibratory roller to achieve the desired								
	density.)								
					TOTAL	20,406	cum		71,400,594
A3.3	Prime Coat					20,100	cum		71,100,051
SOR.	D.F.G.GDVDWYO.V	NO.	LENGTH	WIDTH	HEIGHT	O IPPET	* 13 TYM	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNIT	(Rs)	(Rs)
	Prime coat (Providing and applying primer coat with bitumen emulsion on	(*****)	(11)	(***)	(11)			(-10)	(===)
5.1	prepared surface of granular Base including clearing of road surface and								
3.1	spraying primer at the rate shown in 500-1 using mechanical means.)								
	i) Low Porosity					81,625	sqm	47	3,836,375
					TOTAL	81,625	sqm		3,836,375
A3.4	Tack Coat	110	* T3 * COTT *	******	************			D + mn	
SOR.	PERCENTRAL	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
	DESCRIPTION								(Rs)
NO.	DESCRIPTION	(each)	(m)	(m)	(m)			(Rs)	(210)
	DESCRIPTION Tack coat (Providing and applying tack coat with bitumen emulsion using	(each)	(m)	(m)	(m)	,		(KS)	(-10)
		(each)	(m)	(m)	(m)			(RS)	(-20)
NO.	Tack coat (Providing and applying tack coat with bitumen emulsion using	(each)	(m)	(m)	(m)			(RS)	(233)
NO. 5.2	Tack coat (Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)	(each)	(m)	(m)	(m)	80.901	sam	, ,	` ,
NO.	Tack coat (Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at required rate on the prepared	(each)	(m)	(m)	(m)	80,901	sqm sqm	21 28	1,698,921

A 3 5	Danca	Cradad	Bituminous	Macadam

SOR. DESCRIPTION NO. LENGTH WIDTH HEIGHT (RS) (RS) (RS) Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading. premixed with bituminous wheeled, without yand tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hoft mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder 1 all respects.) Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hoft mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder laid on prepared surface and rolling with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, without part of 11 mix policy and adapting bituminous concrete with 100-120 TPH batch type hoft mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder laid on prepared surface and support to the required grade level and alignment, rolling with smooth wheeled, without part of 11 min policy and the provide of 11 min policy with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, without part of 11 min policy with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, without part of 11 min policy with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled steel roller) Case-I Using Bitumen 60-70 grade (i) for Grading I (13 min nominal size) Case-I Using Bitumen 60-70 grade	A3.5	Dense Graded Bituminous Macadam								
Desc Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, wibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) Bituminous Concrete Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder et al. 45 to 5.6 so finis and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment. Follow wheeled, wibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 6070 grade	SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Olimir	LINITE	RATE	AMOUNT
macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with summous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) Total	NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QIY	UNII	(Rs)	(Rs)
A3.6 Bituminous Concrete SOR. NO. DESCRIPTION NO. LENGTH (m) WIDTH (m) QTY UNIT (Rs) (Rs) Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hor mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 60/70 grade (i) for Grading-1 (13 mm nominal size) TOTAL 3,226 cum 16,283 52,528,958 A3.7 Surface Dressing SOR. DESCRIPTION NO. LENGTH (m) WIDTH (Each) (m) QTY UNIT (Rs) (Rs) Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size	5.4	macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction								
A3.6 Bituminous Concrete SOR. DESCRIPTION NO. LENGTH (m) (m) (m) (m) (Rs) (Rs) Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous bider de S.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 60/70 grade	(ii)	for Grading II (19 mm nominal size)					8,090	cum	14,569	117,863,210
SOR. NO. DESCRIPTION NO. (each) LENGTH (m) WIDTH (m) QTY UNIT RATE (Rs) AMOUNT (Rs)						TOTAL	8,090	cum		117,863,210
NO. DESCRIPTION (each) (m) (m) (m) QTY UNIT (Rs) (Rs) Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 60/70 grade (i) for Grading-I (13 mm nominal size) TOTAL 3,226 cum 16,283 52,528,958 A3.7 Surface Dressing SOR. NO. DESCRIPTION NO. LENGTH (m) WIDTH (m) QTY UNIT RATE (Rs) Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size O sqm 0 sqm 0		Bituminous Concrete								
Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 60/70 grade		DESCRIPTION					O'TY	UNIT		
TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects) Case-I Using Bitumen 60/70 grade (i) for Grading-I (13 mm nominal size) TOTAL 3,226 cum 16,283 52,528,958 A3.7 Surface Dressing SOR. NO. DESCRIPTION NO. DESCRIPTION NO. LENGTH (m) WIDTH (m) QTY UNIT (Rs) RATE AMOUNT (Rs) Case-I: 19 mm nominal chipping sizi Case-I: 19 mm nominal chipping sizi	NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	01111	(Rs)	(Rs)
(i) for Grading-I (13 mm nominal size) TOTAL 3,226 cum 16,283 52,528,958 TOTAL 3,226 cum 55,528,958 TOTAL 3,226 cum 55,528,958 Surface Dressing SOR. NO. DESCRIPTION NO. Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size TOTAL 3,226 cum 16,283 52,528,958 TOTAL 3	5.5	TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)								
A3.7 Surface Dressing SOR. NO. Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size TOTAL 3,226 cum Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size TOTAL 3,226 cum Surface Dressing (PTY UNIT (Rs) (Rs) (Rs) Case-II 19 mm nominal chipping size										
A3.7 Surface Dressing SOR. NO. DESCRIPTION Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size NO. LENGTH (m) WIDTH (m) QTY UNIT (Rs) AMOUNT (Rs) (Rs) Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size	(i)	for Grading-1 (13 mm nominal size)		l		mom/*			16,283	
SOR. NO. Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size NO. (each) NO. (each) (m) WIDTH (m) WIDTH (m) WIDTH (m) WIDTH (m) WIDTH (m) OTY UNIT RATE (Rs) AMOUNT (Rs) O sqm 0	427	Confere Description				TOTAL	3,226	cum	l .	52,528,958
NO. DESCRIPTION (each) (m) (m) (m) QTY UNIT (Rs) (Rs) Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size O sqm 0		Surface Dressing	NO	LENGTH	WIDTH	UEIGUT			DATE	AMOUNT
Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller) Case-I: 19 mm nominal chipping size O sqm O		DESCRIPTION					Q'TY	UNIT		
		single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller)	(eacn)	(111)	(III)	(111)			(RS)	
TOTAL 0 sqm 0		Case-I: 19 mm nominal chipping siza								0
						TOTAL	0	sqm		0

A3.8 Carriage of Materials

SOR.	Carriage of Materials	WORK	UNIT	CARRIAG	* 13 17m	RATE	AMOUNT
NO.	DESCRIPTION	Q'TY	Q'TY	E Q'TY	UNIT	(Rs)	(Rs)
-	Cost of Haulage for Granular Sub-base						
	i) Aggregate	24,830	1.28	31,782	cum	1,905.73	60,568,515
	ii) Sand				cum	1,939.20	0
	iii) Lime/Fille				cum	2,567.67	0
	iv) Bitumen				tonne	2,103.50	0
-	Cost of Haulage for Wet Mix Macadam						
	i) Aggregate	20,400	1.32	26,936	cum	1,905.73	51,332,457
	ii) Sand				cum	1,939.20	0
	iii) Lime/Fille				cum	2,567.67	0
	iv) Bitumen				tonne	2,103.50	0
-	Cost of Haulage for Dense Graded Bituminous Macadam						
	i) Aggregate	8,090		,	cum	1,905.73	22,200,934
	ii) Sand	8,090		- / -	cum	1,939.20	.,,.
	iii) Lime/Fille	8,090			cum	2,567.67	415,448
	iv) Bitumen	8,090	0.1	809	tonne	2,103.50	1,701,732
-	Cost of Haulage for Bituminous Concrete						
	i) Aggregate	3,220			cum	1,905.73	8,975,889
	ii) Sand	3,220			cum	1,939.20	
	iii) Lime/Fille	3,220			cum	2,567.67	165,666
	iv) Bitumen	3,220			tonne	2,103.50	
			TOTAL	1	LS		156,049,721

A7.1	Traffic	Sign
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SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	***	(each)	(m)	(m)	(m)	.		(Rs)	(Rs)
	Retro- reflectorised Traffic signs (Providing and fixing of retro- reflectorised								
	cautionary, mandatory and informatory sign as per IRC :67 made of								
	encapsulated lens type reflective sheeting vide clause 801.3, fixed over								
8.4	aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75								
	mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed								
	foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm								
	below ground level as per approved drawing)								
(i)	90 cm equilateral triangle					28	each	11,171	312,788
(ii)	60 cm equilateral triangle					0	each	6,901	(
(iii)	60 cm circular					8	each	9,696	77,568
(iv)	80 mm x 60 mm rectangular					8	each	14,032	112,256
(v)	60 cm x 45 cm rectangular					0	each	9,410	
(vi)	60 cm x 60 cm square					0	each	11,391	C
					TOTAL	44	each		502,612
A7.2	Road Marking							,	
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	.		(Rs)	(Rs)
	Road Marking with Hot Applied Thermoplastic Compound with								
	Reflectorising Glass Beads on Bituminous Surface (Providing and laying of								
8.13	hot applied thermoplastic compound 2.5 mm thick including reflectorising glass					1,756	sqm	1,332	2,338,992
0.15	beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface					1,750	sqiii	1,332	2,330,772
	applied glass beads as per IRC:35 .The finished surface to be level, uniform and								
	free from streaks and holes.)								
	·				TOTAL	1,756	sqm		2,338,992
A7.3	Road Delineator								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Road Delineators (Supplying and installation of delineators (road way								
	indicators, hazard markers, object markers), 80-100 cm high above ground level,								
8.15	painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm					801	each	4,851	3,885,651
	rectangular or 75 mm dia circular reflectorised panels at the top, buried or								
	pressed into the ground and confirming toIRC-79 and the drawings.)								
					TOTAL	801	each		3,885,651

A7.4 Guard Rail

A7.4	Guard Rail								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIFTION	(each)	(m)	(m)	(m)	ŲII	UNII	(Rs)	(Rs)
8.23	Metal Beam Crash Barrier								
A	Type - A, "W": Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810)					1,200	metre	6,452	7,742,400
					TOTAL	1,200	metre		7,742,400
A7.5	Street Furniture							•	•
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Road Markers/Road Stud with Lense Reflector (Providing and fixing of road								
8.35	stud 100x 100 mm, die cast in aluminium, resistant to corrosive effect of salt and					3,600	each	1,476	5,313,600
	orit fitted with lense reflectors, installed in concrete or asphaltic surface by								
					TOTAL	3,600	each		5,313,600

8.16

A8.1	Kilometer Stone (5km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(i)	5th kilometre stone (precast)					1	each	6,147	6,147
					TOTAL	1	each		6,147
A8.2	Kilometer Stone (1km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(ii)	Ordinary Kilometer stone (Precast)					6	each	3,701	22,206
					TOTAL	6	each		22,206
A8.3	Kilometer Stone (200m)								
SOR.	DECOMPTION	NO.	LENGTH	WIDTH	HEIGHT	OPTM	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of			` '	` ′			ì	, ,
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(iii)	Hectometer stone (Precast)					28	each	1,019	28,532
					TOTAL	28	each		28,532
A8.4	Boundary Stone								-
SOR.	DECOMPTION	NO.	LENGTH	WIDTH	HEIGHT	OPTV	UNIT	RATE	AMOUNT
NO	DESCRIPTION	(acab)	(***)	(***)	(***)	Q'TY	UNII	(Da)	(Da)

141

141

TOTAL

each

each

961

135,501 135,501

Boundary pillar (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)

						Rs)		st (in F ulage ir	•	Mult	iplying Fact	or For		Lead in km	ı		
SI.No.	Name of Materials	Unit	Truck Capacity Per Trip	Multiplying Factor	Net Payable Quantity	Cost of Loading and Unloading (In Rs)	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Surface Road = (8/Col. 6)xCol. 8	Unsurfaced Road = (8/Col. 6) x Col. 9	Katcha Track & Track in River Bed/Nalah Bed & Choe Bed =(8/Col. 6) x Col. 10	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Cost of Carriage (In Rs) $= [(H_s.L_s + H_u.L_u + H_k.L_k) + Col. 7]$	Remarks
										H _s	H _u	H _k	L _s	L _u	L_k		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
01	Local Sand (Fine)	m ³	6	0.8	4.80	211	11.8	13.5	18.4	19.67	22.50	30.67	85	4	0	1972.67	
09	Coarse Sand	m ³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	85	4	0	1905.73	
01	Lime	m ³	6	1	6	211	10.1	11.9	16.2	13.47	15.85	21.60	175	0	0	2567.67	Rs Per M ³
07	Stone Chips, Stone Aggregate 50mm & down	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	85	4	0	1905.73	
12	Bitumen Barauni	МТ	8	1	8	336	10.1	11.9	16.2	10.10	11.89	16.2	175	0	0	2103.50	Rs Per MT

Note: This calculation sheet was derived from cost estimate of DPR (NH54 Section 2)
Lead distances were revised by JICA Study Team for Bypass

ABSTRACT OF COST ESTIMATE

S. NO.	DESCRIPTION	AMOUNT (Rs, Lac)	SHARE
(A) CON	STRUCTION COST	(Its, Euc)	
A1	SITE CLEARANCE	3.1	0.05%
A2	EARTHWORK	1,638.4	23.76%
A3	PAVEMENT	1,544.3	22.39%
A4	DRAINAGE	390.6	5.66%
A5	BRIDGE	0.0	0.00%
A6	SLOPE PROTECTION	3,193.0	46.30%
A7	TRAFFIC SAFETY FACILITIES	126.9	1.84%
A8	ROAD APPURTENANCES	0.7	0.01%
	TOTAL OF (A-1)	6,897.1	100%
	CONSTRUCTION COST PER KM	2,616.5	
A9	ESCALATION (5%) UPTO BIDDING 2015 to 2017	707.0	
A10	CONTINGENCY (2.8%)	212.9	
	TOTAL CIVIL WORK COST (A-2)	7,817.0	
	CONSTRUCTION COST PER KM	2,965.5	
(B) GOV	ERNMENT COST		
B1	RELOCATION OF UTILITIES	4.1	
B2	LAND ACQUISITION AND RESETTLEMENT	236.7	
В3	ENVIRONMENTAL MANAGEMENT MEASURES	13.2	
	TOTAL OF (B)	253.9	
	$TOTAL\ COST\ OF\ (A) + (B)$	8,070.9	
	ER COST		
C1	CONSTRUCTION SUPERVISION CHARGE (3 %)	234.5	
C2	QUALITY CONTROL CHARGE (0.25%)	19.5	
C3	ROAD SAFTY AUDIT CHARGE (0.25%)	19.5	
C4	MAINTENANCE FOR 4 YEARS $(1.5\% + 2.0\% \times 3 = 7.5\%)$	586.3	
C5	ESCALATION (15%)	1,172.5	
C6	AGENCY(NHIDCL) CHARGE (3 %)	234.5	
	TOTAL OF (C)	2,266.9	
	TOTAL PROJECT COST (A) + (B) + (C)	10,337.8	
	CONSTRUCTION COST PER KM	3,921.8	

REAK	DOWN OF CONSTRUCTION COST	ı	L=	2.6 kn
S. NO.	DESCRIPTION	Q'TY	UNIT	AMOUNT (Rs)
A) CON A1	STRUCTION COST SITE CLEARANCE			311,89
AI	A1.1 Clearing and Grubbing	5.66	hectare	242,56
	A1.2 Dismantling of Structures	1	LS	
	A1.3 Cutting of Trees	61	each	69,32
A2	EARTHWORK A2.1 Excavation in Soil	24,138	cum	163,843,539 6,036,914
	A2.1 Excavation in Ordinary Rock	193,108	cum	68,186,43
	A2.3 Excavation in Hard Rock	24,138	cum	14,702,45
	A2.4 Excavation for Structures in Soil	563	cum	49,54
	A2.5 Excavation for Structures in Ordinary Rock	4,503	cum	526,85
	A2.6 Excavation for Structures in Hard Rock A2.7 Embankment Construction	563 61,991	cum	562,43 13,018,11
	A2.8 Scarifying Existing Bituminous Surface	01,991	sqm	13,016,11
	A2.9 Subgrade	5,774	cum	3,054,44
	A2.10 Spoil Bank	5	each	57,706,34
A3	PAVEMENT	0.070		154,428,95
	A3.1 Granular Sub-base A3.2 Wet Mix Macadam	8,959 7,361	cum	31,042,93 25,756,13
	A3.3 Prime Coat	29,444	sqm	1,383,86
	A3.4 Tack Coat	29,188	sqm	612,94
	A3.5 Dense Graded Bituminous Macadam	2,919	cum	42,526,91
	A3.6 Bituminous Concrete	1,164	cum	18,953,41
	A3.7 Surface Dressing A3.8 Carriage of Materials	0	sqm LS	34,152,74
A4	DRAINAGE	1	гvэ	34,152,74 39,064,97
	A4.1 Lined Ditch 300 mm	3,143	metre	8,005,22
	A4.2 Sub Surface Drain with Perforated Pipe	0	metre	
	A4.3 Pipe Culvert 1,200 mm (Type-A)	5	each	6,023,43
	A4.4 Pipe Culvert 1,200 mm (Type-B) A4.5 Box Culvert 2 m x 2 m	8	each	6,436,47 18,599,85
	A4.5 Box Culvert 2 m x 2 m A4.6 Box Culvert 3 m x 3 m	0	each each	18,599,85
	A4.7 Box Culvert 4 m x 4 m	0	each	
	A4.8 Box Culvert 4 m x 6 m	0	each	1
A5	BRIDGE			
A6	A5.1 Bridge SLOPE PROTECTION	0	LS	319,303,30
AU	A6.1 Wet Masonry Retaining Wall (H=3m)	1,040	metre	18,775,12
	A6.2 Wet Masonry Retaining Wall (H=7m)	880	metre	58,225,20
	A6.3 Gravity Wall (H=1.5m)	140	metre	2,921,80
	A6.4 Gravity Wall (H=2m)	120	metre	3,339,20
	A6.5 Gravity Wall (H=3m) A6.6 Gravity Wall (H=4m)	280 280	metre	11,687,20 15,582,93
	A6.7 Gravity Wall (H=5m)	200	metre metre	13,913,33
	A6.8 Gravity Wall (H=6m)	200	metre	16,696,00
	A6.9 Reinforced Earth Retaining Wall (H=7m)	160	metre	30,172,98
	A6.10 Reinforced Earth Retaining Wall (H=8m)	140	metre	30,172,98
	A6.11 Reinforced Earth Retaining Wall (H=9m)	80	metre	19,396,91
	A6.12 Reinforced Earth Retaining Wall (H=10m) A6.13 Reinforced Earth Retaining Wall (H=11m)	60 100	metre metre	16,164,09 29,634,18
	A6.14 Reinforced Earth Retaining Wall (H=12m)	20	metre	6,465,64
	A6.15 Reinforced Earth Retaining Wall (H=13m)	40	metre	14,008,88
	A6.16 Reinforced Earth Retaining Wall (H=14m)	0	metre	
	A6.17 Reinforced Earth Retaining Wall (H=15m)	0	metre	
	A6.18 Gabion Wall (1:0.3) A6.19 Rockfall Prevention Wall (H=3m)	0	cum metre	
	A6.20 Rockfall Prevention Fence (H=2m)	0	metre	
	A6.21 Hydroseeding (t=5cm)	0	sqm	
	A6.22 Seeding and Mulching (Soil Cut Slope)	3,361	sqm	904,10
	A6.23 Turfing (Embankment)	265	sqm	23,85
	A6.24 Vegetation Mat (Steep Slope) A6.25 Crib Work (F300)	1,091 1,510	sqm sqm	2,621,83 5,522,34
	A6.26 Crib Work (F500)	0	sqm	3,322,34
	A6.27 Non-frame	0	sqm	
	A6.28 Earth Removal	0	cum	
	A6.29 Counterweight Fill	0	cum	
	A6.30 Groundwater Drainage Work A6.31 Anchor Work	0	metre metre	
	A6.32 Rock-bolt Work	1,133	metre	7,137,90
	A6.33 Landslide Prevention Work	1	LS	15,936,79
A7	TRAFFIC SAFETY FACILITIES		-	12,686,80
	A7.1 Traffic Sign	650	LS	430,58
	A7.2 Road Marking A7.3 Road Delineator	659 181	sqm each	877,78 878,03
	A7.4 Guard Rail	1,250	metre	8,065,00
	A7.5 Street Furniture	1,650	each	2,435,40
4.0	ROAD APPURTENANCES			69,54
A8	A8.1 Kilometer Stone (5km)	0	each	=
Αδ		2	each	7,40 11,20
Að	A8.2 Kilometer Stone (1km)	11	each	
A8	A8.3 Kilometer Stone (200m)	11 53	each each	
A8		11 53 0	each each each	50,93
A8	A8.3 Kilometer Stone (200m) A8.4 Boundary Stone	53	each	50,93. 689,709,01

A1.1 Clearing and Grubbing

SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
2.3	Clearing and Grubbing Road Land. (Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness.)								
(ii)	By Mechanical Means								
A	In area of light jungle						hectare	34,923	0
В	In area of thorny jungle					5.66	hectare	42,856	242,565
					TOTAL	5.66	hectare		242,565

A1.2 Dismantling of Structures

A1.2	Dismantling of Structures								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH	HEIGHT	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
A.1.2.1	Dismantling of Structures	(eacn)	(m)	(m)	(m)			(KS)	(KS)
	Dismantling of Structures (Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material with all lifts and lead of 1000 metres)								
(i)	Lime /Cement Concrete			-					
II	By Mechanical Means for items No. 202(b) & (c)								
A	Cement Concrete Grade M-15 & M-20					0.00	cum	835	0
(iii)	Dismantling Stone Masonry					0.00		520	
В	Rubble stone masonry in cement mortar					0.00	cum	530	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0.00	tonne.km	11.80	0
				SU	JB TOTAL				0
A.1.2.2	Dismantling of Flexible Pavemets								
2.5	Dismantling of Flexible Pavements (Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately)								
II	By Mechanical Means							-	
A	Bituminous course					0.00	cum	508	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0.00	tonne.km	11.80	0
				SU	JB TOTAL				0
					TOTAL	1	LS		0

A1.3 Cutting of Trees

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIFTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
2.1	Cutting of Trees, including Cutting of Trunks, Branches and Removal (Cutting of trees, including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 mtrs and earth filling in the depression/pit.)								
(i)	Girth from 300 mm to 600 mm					33	each	428	14,162
(ii)	Girth from 600 mm to 900 mm					20	each	778	15,605
(iii)	Girth from 900 mm to 1800 mm					6	each	4,277	27,683
(iv)	Girth above 1800 mm					1	each	8,555	11,879
	_				TOTAL	61	each		69,329

A2.1 Excavation in Soil

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Excavation in Hilly Areas in Ordinary Soil By Mechanical Means								
3.30	(Excavation in ordinary soil in hilly area by mechanical means including cutting								
3.30	and trimming of side slopes and disposing of excavated earth with all lifts and								
	lead)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					24,138	cum	197	4,755,186
	Case-II: Disposing cut material on the valley side						cum	90	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			43448	tonne.km	11.80	1,281,728
					TOTAL	24138	cum		6,036,914

A2.2 Excavation in Ordinary Rock

A2.2	Excavation in Ordinary Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	CIVII	(Rs)	(Rs)
A.2.2.1	Excavation in Ordinary Rock not Requiring Blasting								
	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not								
3.31	Requiring Blasting. (Excavation in hilly area in ordinary rock not requiring								
3.31	ballasting by mechanical means including cutting and trimming of slopes and								
	disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					193,108	cum	300	57,932,400
	Case-II: Disposing cut material on the valley side						cum	155	0
	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7								
1.1	Loading and unloading of stone boulder/stone aggregates/sand/							211	0
1.1	kanker/moorum. (Placing tipper at loading point, loading with front end loader,						cum	211	0
	dumping, turning for return trip, excluding time for haulage and return trip)								
	Cost of Haulage Excluding Loading and Unloading For Short Haul for a								
1.6	distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			347,594	tonne.km	11.80	10,254,035
(1)	Surraced Road		2.3	C)	UB TOTAL	193,108	cum	11.60	68,186,435
Δ 2 2 2	Excavation in Ordinary Rock Requiring Blasting				DIOIAL	193,100	Cum		00,100,433
11.2.2.2			1						
	Excavation in Hilly Areas in laminated rock (requiring blasting) By Mechanical								
	Means (Excavation for roadway in hilly areas in laminated rock (requiring								
3.32	blasting) which are not suitable for construction of masonry and pavement by								
	drilling, blasting and breaking, trimming of bottom and side slopes in accordance								
	with requirements of lines, grades and cross sections, loading and disposal of cut								
	road with in all lifts and leads upto 1000 metres.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					0	cum	392	0
	Case-II: Disposing cut material on the valley side						cum	290	0
	Loading and unloading of stone boulder/stone aggregates/sand/								
1.1							aum	211	0
1.1	kanker/moorum. (Placing tipper at loading point, loading with front end loader,						cum	211	Ü
	dumping, turning for return trip, excluding time for haulage and return trip)								
	Cost of Haulage Excluding Loading and Unloading For Short Haul for a								
1.6	distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			0	tonne.km	11.80	0
	1			S	UB TOTAL	0	cum		0
					TOTAL	193,108	cum		68,186,435

A2.3 Excavation in Hard Rock

A2.3	Excavation in Hard Rock								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
3.33	Excavation in Hilly Areas in Hard Rock Requiring Blasting (Excavation in hilly areas in hard rock requiring blasting, by mechanical means including trimming of slopes and disposal of cut material.)								
	Case-I: Disposal of cut material with all lifts and lead upto 1000 metres					24,138	cum	556	13,420,728
	Case-II: Disposing cut material on the valley side						cum	411	0
1.1	Loading and unloading of stone boulder/stone aggregates/sand/ kanker/moorum. (Placing tipper at loading point, loading with front end loader, dumping, turning for return trip, excluding time for haulage and return trip)						cum	211	0
1.6	Cost of Haulage Excluding Loading and Unloading For Short Haul for a distance upto 100 km		Lead (km)						
(i)	Surfaced Road		2.5			43,448	tonne.km	11.80	1,281,728
					TOTAL	24,138	cum		14,702,456
A2.4	Excavation for Structures in Soil								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	V	0.11	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(i)	Ordinary soil								
В	Mechanical Means (Depth upto 3 m)					563	cum	88	49,544
					TOTAL	563	cum		49,544
A2.5	Excavation for Structures in Ordinary Rock								<u> </u>
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	BLECKII 11011	(each)	(m)	(m)	(m)	V 1.1	01111	(Rs)	(Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)								
(ii)	Ordinary rock (not requiring blasting)								
В	Mechanical Means					4,503	cum	117	526,851
					TOTAL	4,503	cum		526,851

A2.6	Excavation for Structures in Hard Rock								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.11	Excavation for Structures (Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work.)	(5.00.1)	(11)	(11)	(117)			()	(-1.7)
(iii)	Hard rock (requiring blasting)								
A	Manual Means					563	cum	999	562,437
					TOTAL	563	cum		562,437
SOR. NO.	Embankment Construction DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.15	Construction of Embankment with Material Deposited from Roadway Cutting (Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures graded and compacted to meet requirement of table 300-2)					61,991	cum	210	13,018,110
				•	TOTAL	61,991	cum		13,018,110
A2.8	Scarifying Existing Bituminous Surface								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.13	Scarifying existing bituminous surface to a depth of 50 mm by mechanical means (Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts and lead upto 1000 metres.)					0	sqm	21	0
					TOTAL	0	sqm		0
A2.9	Subgrade								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
3.16	Construction of Subgrade and Earthen Shoulders (Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2)					5,774	cum	529	3,054,446

TOTAL

cum

3,054,446

A3.1	Granular Sub	-haca

A3.1	Granular Sub-base								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
4.1	Granular Sub-base with Close Graded Material (Table:- 400-1)								
	Plant Mix Method (Construction of granular sub-base by providing close graded Material, mixing in a mechanical mix plant at OMC, carriage of mixed								
A	Material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired								
	density, complete as per clause 401)								
(i)	for grading- I Material						cum	3,391	0
(ii)	for grading- II Material					8,959	cum	3,465	31,042,935
(iii)	for grading-III Material						cum	3,359	0
					TOTAL	8,959	cum		31,042,935
A3.2	Wet Mix Macadam								<u>.</u>
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
4.11	Wet Mix Macadam (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub-base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.)					7,361	cum	3,499	25,756,139
					TOTAL	7,361	cum		25,756,139
A3.3	Prime Coat								
SOR. NO.	DESCRIPTION	NO. (each)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	Q'TY	UNIT	RATE (Rs)	AMOUNT (Rs)
5.1	Prime coat (Providing and applying primer coat with bitumen emulsion on prepared surface of granular Base including clearing of road surface and spraying primer at the rate shown in 500-1 using mechanical means.)								
	i) Low Porosity					29,444	sqm	47	1,383,868
	, ,				TOTAL	29,444	sqm		1,383,868
A3.4	Tack Coat						-		
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	ŲII	UNII	(Rs)	(Rs)
	Tack coat (Providing and applying tack coat with bitumen emulsion using								
			1		l	l l		1	
5.2									
5.2	emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)								
	emulsion pressure distributor at required rate on the prepared bituminous/granular surface cleaned with mechanical broom.)					29.188	sam	21	612,948
5.2 i) iii)	emulsion pressure distributor at required rate on the prepared					29,188	sqm sqm	21	612,948

125	D	C 1- 1	D:4	M 1
A3.5	Dense	Cyraded	Bituminous	viacadam

NO. Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) (ii) for Grading II (19 mm nominal size) TOTAL 2,919 cum	RATE (Rs)	AMOUNT (Rs)
Dense Graded Bituminous Macadam (Providing and laying dense bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) (iii) for Grading II (19 mm nominal size) A3.6 Bituminous Concrete SOR. DESCRIPTION NO. Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.		(Rs)
macadam with 100-120 TPH batch type HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5% by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification clause No. 507 complete in all respects.) (ii) for Grading II (19 mm nominal size) A3.6 Bituminous Concrete SOR. NO. DESCRIPTION NO. Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.	14,569	
A3.6 Bituminous Concrete SOR. DESCRIPTION Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.	14,569	
A3.6 Bituminous Concrete SOR. NO. DESCRIPTION NO. LENGTH (m) VIDIT (m) VIDI		42,526,911
SOR. NO. DESCRIPTION Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.		42,526,911
NO. DESCRIPTION (each) (m) (m) QTY UNIT Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.		
Bituminous Concrete (Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.	RATE	AMOUNT
TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 % of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade.	(Rs)	(Rs)
to achieve the desired compaction as per MORTH specification clause No. 509 complete in all respects)		
Case-I Using Bitumen 60/70 grade		
(i) for Grading-I (13 mm nominal size) 1,164 cum	16,283	18,953,412
TOTAL 1,164 cum		18,953,412
A3.7 Surface Dressing SOR. NO. LENGTH WIDTH HEIGHT	RATE	AMOUNT
NO. DESCRIPTION (each) (m) (m) (m) (TY UNIT III)	(Rs)	(Rs)
Surface Dressing (Providing and laying surface dressing as wearing course in single coat using crushed stone aggregates of specified size on a layer of bituminous binder laid on prepared surface and rolling with 8-10 tonne smooth wheeled steel roller)	(Ko)	(RS)
Case-I: 19 mm nominal chipping siza 0 sqm		0
TOTAL 0 sqm		0

A3.8 Carriage of Materials

	Carriage of Materials						
SOR.	DESCRIPTION	WORK	UNIT	CARRIAG	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	Q'TY	Q'TY	E Q'TY	UNII	(Rs)	(Rs)
-	Cost of Haulage for Granular Sub-base						
	i) Aggregate	8,959	1.28	11,468	cum	1,119.29	12,835,472
	ii) Sand				cum	1,137.23	0
	iii) Lime/Fille				cum	4,116.33	0
	iv) Bitumen				tonne	3,265.00	0
-	Cost of Haulage for Wet Mix Macadam						
	i) Aggregate	7,361	1.32	9,717	cum	1,119.29	10,875,596
	ii) Sand				cum	1,137.23	0
	iii) Lime/Fille				cum	4,116.33	0
	iv) Bitumen				tonne	3,265.00	0
-	Cost of Haulage for Dense Graded Bituminous Macadam						
	i) Aggregate	2,919	1.44		cum	1,119.29	4,704,776
	ii) Sand	2,919	0.45		cum	1,137.23	1,493,806
	iii) Lime/Fille	2,919	0.02	58	cum	4,116.33	240,312
	iv) Bitumen	2,919	0.1	292	tonne	3,265.00	953,054
-	Cost of Haulage for Bituminous Concrete						
	i) Aggregate	1,164	1.46		cum	1,119.29	1,902,165
	ii) Sand	1,164	0.45		cum	1,137.23	595,680
	iii) Lime/Fille	1,164	0.02		cum	4,116.33	95,828
	iv) Bitumen	1,164	0.12		tonne	3,265.00	456,055
	<u> </u>		TOTAL	1	LS		34,152,743

A7.1	Traffic	Sign

SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	OPTV	UNIT	RATE	AMOUNT
NO.	DESCRIPTION	(each)	(m)	(m)	(m)	Q'TY	UNII	(Rs)	(Rs)
	Retro- reflectorised Traffic signs (Providing and fixing of retro- reflectorised								
	cautionary, mandatory and informatory sign as per IRC :67 made of								
	encapsulated lens type reflective sheeting vide clause 801.3, fixed over								
8.4	aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75								
	mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed								
	foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm								
	below ground level as per approved drawing)								
(i)	90 cm equilateral triangle					20	each	11,171	223,420
(ii)	60 cm equilateral triangle					0	each	6,901	(
(iii)	60 cm circular					4	each	9,696	38,784
(iv)	80 mm x 60 mm rectangular					12	each	14,032	168,384
(v)	60 cm x 45 cm rectangular					0	each	9,410	0
(vi)	60 cm x 60 cm square					0	each	11,391	C
					TOTAL	36	each		430,588
A7.2	Road Marking				· ·				
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	`		(Rs)	(Rs)
	Road Marking with Hot Applied Thermoplastic Compound with								
	Reflectorising Glass Beads on Bituminous Surface (Providing and laying of								
8.13	hot applied thermoplastic compound 2.5 mm thick including reflectorising glass					659	sqm	1,332	877,788
0.11	beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface							-,	011,100
	applied glass beads as per IRC:35 .The finished surface to be level, uniform and								
	free from streaks and holes.)								
					TOTAL	659	sqm		877,788
A7.3	Road Delineator							,	
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.	**************************************	(each)	(m)	(m)	(m)	(· · ·		(Rs)	(Rs)
	Road Delineators (Supplying and installation of delineators (road way								
0.15	indicators, hazard markers, object markers), 80-100 cm high above ground level,					101	,	4.051	070.00
8.15	painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm					181	each	4,851	878,031
	rectangular or 75 mm dia circular reflectorised panels at the top, buried or								
	pressed into the ground and confirming toIRC-79 and the drawings.)			l	TOTAL	101			979 021
					TOTAL	181	each		878,031

A7.4 Guard Rail

A/.4	Guard Raii								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	,		(Rs)	(Rs)
8.23	Metal Beam Crash Barrier								
A	Type - A, "W": Metal Beam Crash Barrier (Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per clause 810)					1,250	metre	6,452	8,065,000
					TOTAL	1,250	metre		8,065,000
A7.5	Street Furniture								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	OPTM	LINIT	RATE	AMOUNT

	11/10	Street I drimed to								
ſ	SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	O'TY	UNIT	RATE	AMOUNT
١	NO.	DESCRIPTION	(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
ſ		Road Markers/Road Stud with Lense Reflector (Providing and fixing of road								
۱	8.35	stud 100x 100 mm, die cast in aluminium, resistant to corrosive effect of salt and					1,650	each	1,476	2,435,400
L		grit fitted with lense reflectors, installed in concrete or asphaltic surface by								
ſ						TOTAL	1,650	each		2,435,400

A8.4 Boundary Stone
SOR.
NO.

8.16

DESCRIPTION

Boundary pillar (Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, fixed in position including finishing and lettering but excluding painting)

A8.1	Kilometer Stone (5km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
(1)	nrinting etc)					0		< 1.47	0
(i)	5th kilometre stone (precast)	ļ			momit	0	each	6,147	0
					TOTAL	0	each		0
A8.2	Kilometer Stone (1km)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(ii)	Ordinary Kilometer stone (Precast)					2	each	3,701	7,402
					TOTAL	2	each		7,402
A8.3	Kilometer Stone (200m)								
SOR.	DESCRIPTION	NO.	LENGTH	WIDTH	HEIGHT	Q'TY	UNIT	RATE	AMOUNT
NO.		(each)	(m)	(m)	(m)	QII	UNII	(Rs)	(Rs)
	Kilo Metre Stone (Reinforced cement concrete M15grade kilometre stone of								
8.14	standard design as per IRC:8-1980, fixing in position including painting and								
	printing etc)								
(iii)	Hectometer stone (Precast)					11	each	1,019	11,209
					TOTAL	11	each		11,209
101	D 1 C4	•							

(each)

LENGTH

WIDTH

HEIGHT

TOTAL

Q'TY

53 each

53 each

UNIT

RATE (Rs)

961

AMOUNT

50,933

50,933

(Rs)

	Name of Materials	Unit	Truck Capacity Per Trip	Multiplying Factor	Net Payable Quantity	Cost of Loading and Unloading (In Rs)	Cost (in Rs) of Haulage in t-km			Multiplying Factor For			Lead in km				
SI.No.							Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Surface Road = (8/Col. 6)xCol. 8	Unsurfaced Road = (8/Col. 6) x Col. 9	Katcha Track & Track in River Bed/Nalah Bed & Choe Bed =(8/Col. 6) x Col. 10	Surfaced Road	Unsurfaced Gravelled Road	Katcha Track & Track in River Bed/Nallah Bed & Choe Bed	Cost of Carriage (In Rs) $= [(H_s.L_s + H_u.L_u + H_k.L_k) + Col. 7]$	Remarks
										H _s	H _u	H _k	L _s	L _u	L _k		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
01	Local Sand (Fine)	m ³	6	0.8	4.80	211	11.8	13.5	18.4	19.67	22.50	30.67	40	7	0	1155.17	
09	Coarse Sand	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	40	7	0	1119.29	
01	Lime	m ³	6	1	6	211	10.1	11.9	16.2	13.47	15.85	21.60	290	0	0	4116.33	Rs Per M ³
07	Stone Chips, Stone Aggregate 50mm & down	m³	5.4	0.924	4.99	211	11.8	13.5	18.4	18.92	21.65	29.50	40	7	0	1119.29	
12	Bitumen Barauni	МТ	8	1	8	336	10.1	11.9	16.2	10.10	11.89	16.2	290	0	0	3265.00	Rs Per MT

Note: This calculation sheet was derived from cost estimate of DPR (NH54 Section 2)
Lead distances were revised by JICA Study Team for Bypass