SHREM FINANCIAL PRIVATE LIMITED

Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Hassan – Ramanathapura – Periyapatna in the State of Karnataka on DBFOMT Hybrid Annuity Basis

TECHNICAL DUE DILIGENCE REPORT

FEBRUARY, 2021

SUBMITTED BY

RUKY PROJECTS PRIVATE LIMITED
Hyderabad – 500 072
www.rukyprojects.com

Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Hassan – Ramanathapura – Periyapatna in the State of Karnataka on DBFOMT Hybrid Annuity Basis

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RUKY Projects Private Limited
#1403A, Manjeera Trinity Corporate, JNTU-HITEC City Road,
Kukatpally, Hyderabad – 500 072, Telangana, India,
+91 40 4855 7777 / 2304 4777
www.rukyprojects.com

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Technical Consultant:
RUKY PROJECTS PRIVATE LIMITED
Flat No. 1403A, 14th Floor,
Manjeera Trinity Corporate,
JNTU-Hitech City Road, Kukatpally,
Hyderabad – 500072
www.rukyprojects.com

Contact Person of Consultant: Mr. C Ramanaiah
Email: ramana_c@rukyprojects.com
Tel: +91 40 4855 7777

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CHAPTER 1. INTRODUCTION

1.1 General

DBL Hasan Periyapatna Tollways Ltd. (herein after referred to as the "Concessionaire") had augmented the existing two lanes road "Hassan Periyapatna section in the State of Karnataka, in accordance with the provisions of Concession Agreement executed with Karnataka Road Development Corporation Limited (herein after referred to as the "KRDCL") on the 16th December 2015, on Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) on Hybrid Annuity Basis.

The project Highway passes through SH21 comprising (i) Hassan (Sakleshpur Jn.) To Arakalgud (Mini Sowdha Jn.) (ii) Arakalgud (Mini Sowdha Jn.) to Ramanathapura (Konanur Jn.) (iii) J. Hosahalli - Periyapatna . Project location map is provided at Figure 1.1.

SHREM ROADWAYS PVT. LTD. (SRPL) acquired DBL HASSAN PERIYAPATNA TOLLWAYS LIMITED vide agreement dated 26th March 2018.

SHREM FINANCIAL PVT. LTD (SFPL). appointed M/s RUKY Projects Pvt. Ltd. as consultant for detailed Technical Due Diligence services of the above Road Project to know-how the present condition of Carriageway and Structures, probable costs of Operations and Maintenance during balance Concession period, additional road safety requirements.

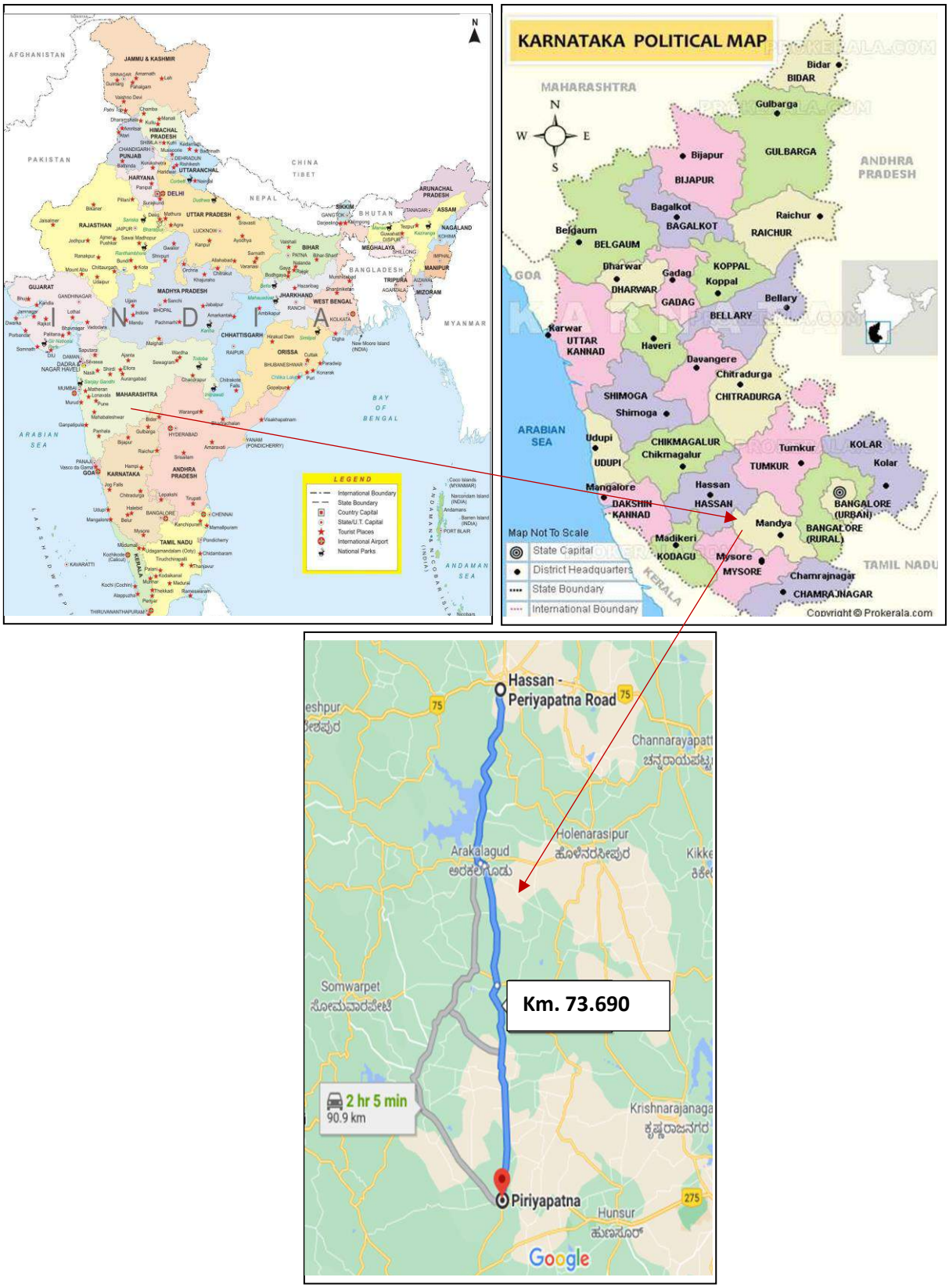

Figure 1.1: Project Location Map

1.2 The Project Data

Table 1.1: Project Data

S.No.	Particulars	Details
1.	Name of the project	Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Hassan-Ramnathapura-Periyapatna in the state of Karnataka on DBFOMT annuity basis.
2.	Road Type	State Highway
3.	Name of the Authority	KRDCL
4.	Name of the Concessionaire	DBL Hassan Periyapatna Tollways Limited
5.	Name of the EPC Contractor	Dilip Buildcon Limited
6.	LOA	11.09.2015
7.	Date of agreement	16.12.2015
8.	Date of Supplementary Agreement I	29.09.2016
9.	Date of Supplementary Agreement II	17.04.2018
10.	Design Length as per Schedule I of CA	73.690 Km.
11.	Actual Length Constructed	73.690 Km.
12.	EPC Cost	Rs. 220.41 Cr.
13.	Nature of contract	DBFMOT (Hybrid Annuity)
14.	Toll collected by	Authority
15.	Concession Period	10 years from Appointed Date
16.	Appointed date	29.09.2016
17.	Concision End Date	28.09.2026
18.	Construction Period	730 Days from Appointed Date
19.	Schedule Completion Date	28.09.2018
20.	Date of issuance of Provisional Certificate (Commercial Operation Date)	28.02.2018
21.	Bonus on early completion	Applicable as per Cl,28.1 of CA
22.	Total Annuity Amount	As per 27.1 of CA
23.	Total Number of Annuity payments received as on Jan 2021	16
24.	First Annuity Date	29.03.2019
25.	Forth coming Annuity No.	05

1.3 Scope of Ruky Projects Private Limited:

The scope of work includes providing Technical Due Diligence of the Project Highway and providing estimate of the anticipated maintenance works. Scope of the work as defined in the consultancy work order is listed below:

- Review of various contractual documents
- Carryout detailed assessment of pavement condition and propose maintenance plan along with BOQ.
- Review of latest BBD/BI test report
- Carrying out inventory & condition survey of all elements of road like embankment slope, plantation, road furniture, tolling system etc., of the project.
- Carrying out inventory & condition survey of all structures (Major Bridges, Minor Bridges, ROB, RE Wall, Flyovers, VUPs, PUPs, Culverts etc.), suggest any rehabilitation & maintenance requirements along with BOQ.
- Carryout out road safety audit on Project highway and provide suggestions for improvement.
- Assess and Provide BOQ and cost estimate for routine & periodic maintenance including O&M.
- Review of punch list items, NCR's to identify any uncompleted works as on date of submission of report.
- Review of validity of insurance and statutory compliances related to Project.
- Review of correspondences exchanged between parties on contract related issues and claims etc.
- Submission of detailed report on technical due diligence of the project.

CHAPTER 2. STATUS OF WORK AFTER PCOD

2.1 General

In accordance with Clause 14.3 of Concession Agreement, Provisional certificate was issued on 28th February, 2018 (PCOD) for completed length of 71.940Km out of a total length of 73.690 Km.

2.2 Punch List

A Punch list is a list of tasks and items that need to be completed in specified time, before a construction project can be considered finished. Accordingly, two punch lists were given along with Provisional Certificate. Punch list-1, balance works pending due to reasons attributable to authority. Punch List-II, works delayed attributable to concessionaire are included in this list shall be completed within 90 days from the issuance of Provisional certificate.

Table 2.1: Punch List-I

a. Punch List for Provisional completion sections for the Reasons attributed to Authority)

S.No.	Description	Location	Length/Number (Km)	Present Status as per our Site Inspection
1		Link-54A	15 Locations	Link 54-A
		3+700		Bus shelter and Kerb work not completed only Bus bay work completed
		17+300		Bus bay and shelter works completed but kerb work not completed
		17+650		Total work not completed (Descoped Ref Letter No.1884 Satra & 766 KRDCL)
		18+440		Total work not completed (Descoped Ref Letter No.1884 Satra & 766 KRDCL)
		18+540		Bus bay & shelter works completed but kerb work not completed
	Bus Bay with shelter	25+370		Total work completed
		25+500		Total work completed
		Link-54B		Link-54B
		5+830		Total work completed
		5+860		Total work completed
		7+100		Total work completed
		7+200		Bus Bay and shelter work completed but kekrb work not completed
		12+400		Total work completed
		14+800		Bus shelter work not completed but bus bay and kerb work completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		Link-54C		Link-54C
		7+950		Bus shelter completed but sheeting work not completed. But bay and kerb work not completed (Descoped Ref Letter No.1884 Satra & 766 KRDCL)
		8+000		Bus shelter completed but sheeting work not completed. But bay and kerb work not completed (DE scoped Ref Letter No.1884 Satra & 766 KRDCL)

S.No.	Description	Location	Length/Number (Km)	Present Status as per our Site Inspection
		Link-54A	10 Locations	
		2+538		Protective works completed
		3+184		Protective works completed
		3+640		Slope protection work not completed at RHS (Descoped Ref Letter N.1884 Satra & 766 KRDCL)
		4+124		Protective works completed
2	Protective works for culverts	5+926		Floor apron work not completed
		6+390		Protective works completed
		6+474		Protective works completed
		6+867		Protective works completed
		8+579		Protective works completed
		24+645		Floor apron work not completed(Descoped Ref Letter NO.1884 Satra & KRDCL)
3	RCC Drain/Kerb and Footpath	Link-54B		Link-54B
		Km.3+711 to Km.3+749		Completed
		Km.10+890 to Km.10+929, Km.10+939 to 10+944, Km.10+994 to Km.11+004		1200 Mtrs Footpath work not completed at BHS
4	Earthen Drain	Lini-54A-14.9Km on LHS & 14.8 Km on RHS	46.4 Kms	Completed
		Link 54B-2.8 km on LHD & 1.0 Km on RHS		Completed
		Link-54C -07Km on LHS & 05 Km on RHS		Completed

b. Punch list for Non-Provisional Completion Sections (for the reasons Attributed to Authority)

S.No.	Description	Location	Length/Number (Km)	Present Status as per our Site Inspection
1	Main Carriageway works as per design and drawings	From Km.1+120 to Km.2+300 (Link 54A)		Total work completed
2	Toll Plaza	Link 54A		RHS-3 Lane completed
				structure of Admin, Residential and medical Building completed
				Balance works: LHS:3 Lane PQC
				1. Kerb
				2. Compound wall
				3. Canopy
				4. High Mast lighting pole 30 m height
				5. Balance sign boards
				6. Parking area
				7. Landscaping & Exist and Entry Roads
				8. Toll Booth Electrical WIMS
				9. Miscellaneous items
3	Toll Plaza	Link 54B	11+700	1. LHS-3 Lane completed
				2. RHS-3 Lane Completed
				3. Structure of Admin Residential & Medical Building completed
				4. Canopy Completed
				Balance works:
				1. Kerb
				2. Compound wall
				3. High Mast lighting pole 30 m height
				4. Balance sign boards

				5. Parking area
				6. Landscaping & Exist and Entry Roads
				7. Toll Booth Electrical WIMS
				8. Miscellaneous items
4	Toll Plaza	Link 54C	16+520	1. LHS-3 Lane completed
				2. RHS-3 Lane Completed
				3. Structure of Admin Residential & Medical Building completed
				4. Canopy Completed
				Balance works:
				1. Kerb
				2. Compound wall
				3. High Mast lighting pole 30 m height
				4. Balance sign boards
				5. Parking area
				6. Landscaping & Exist and Entry Roads
				7. Toll Booth Electrical WIMS
				8. Miscellaneous items
5	Boundary Stones	Link 54-A	1+120 to 29+500(BHS)	Not completed
		Link 54-B	0+000 to 17+048(BHS)	Not completed
		Link 54-C	0+000 to 28+274(BHS)	Not completed

Punch List –II, items to be started or in progress shall be completed within 90 days from the issuance of Provisional certificate. The details are given in the following table.

c. Punch list for Provisional completion section-II (For the Reasons Attributed to the Concessionaire)

Punch List-2

S.No.	Description	Location	Length/Number (Km)	Present Status as per our Site Inspection
		2.628 Km in Link 54 A, B & C	1.29 Kms Kerb and 5.69 Kms Footpath (Descoped 1.887(Kms Footpath Ref. Letter No.1884 Satra & 766KRDCL)	
1	Providing Kerb/Footpath	Link 54-A - 0.714 Km		Link 54A -1640 mts footpath work not completed
		Link 54-B - 1.714 Km		Link 54B-1292 Mts Kerb work not completed, 4056 mts footpath work not completed
		Link 54-C - 0.2 Km		Link54-C-Total work completed
2	Floor Protective work at Pipe/Box culverts	Link-54B	7 Locations	Link 54B
		00+920		Pipe culvert protective work completed
		09+597		Box culvert Protective work completed
		12+033		Pipe culvert protective work completed
		14+228		Pipe culvert protective work completed
		14+730		Pipe culvert protective work completed
		15+534		Pipe culvert protective work completed
		16+070		Pipe culvert protective work completed
3	Silt Fencing structures	Link 54A	16Locations	Link 54A
		15+450		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		26+100		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		Link-54B		Link 54B
		0+900		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		3+220BHS		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		4+300		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		Link 54C		Link 54C
		2+700		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)

S.No.	Description	Location	Length/Number (Km)	Present Status as per our Site Inspection
		6+050		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		7+700		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		9+100		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		10+700		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		18+050		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		18+150		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
		20+400BHS		Not completed (De scoped Ref Letter No.1884 Satra & 766 KRDCL)
4	Bus shelters	Link 54A	11 Locations	Link 54A
		3+300		3+300 Total work completed
		21+420		21+420 Total work completed
		21+440		21+440 Total work completed
		Link 54 B		Link54B
		12+500		12+500 Total work completed
		14+400		14+400 Total work completed
		Link 54C		Link 54C
		9+500		9+500 Total work completed
		9+760		9+760 Total work completed
		18+300		18+300 Total work completed
		18+420		18+420 Total work completed
		25+280		25+280 Total work completed
		25+380		25+380 Total work completed
5	Energising Street Lights	Link 54A - 8 villages	As per design - 535 Nos	Link 54A - 141 Nos completed out of 189 Nos
		Link 54B - 7 Villages		Link 54B - 112 Nos completed out of 144 Nos
		Link 54C-12 Villages		Link 54C - 186 completed out of 188 Nos
				Total street lights 439 Nos completed out of 535 Nos in Link 54A,54B, & 54C (Ref Letter No.DBL/SH21/HAS-PTA/WCO-3/2016-17/459 dated 23rd June 2017)

CHAPTER 3. PROJECT DESCRIPTION & TECHNICAL DETAILS

3.1 Salient Features of the Project:

The salient features described in the following table to be developed as per schedule I of CA including Change of scope.

Table 3.1: Salient Features

S. No.	Particulars	As per CA	As per COS*	As per Site
1	Total Length of 2 Lane (Flexible)	73.690 Kms.	-2.610 Kms.	71.080 Kms.
2	Total Length of 4 Lane (Flexible)	--	2.610 Kms.	2.610 Kms.
3	Toll Plaza	3 Nos.	--	3 Nos.
4	Bus Bays	24 Nos	- 4 Nos.	24 Nos
5	Bus Shelters	28 Nos.	-3 Nos.	21 **Nos
6	Truck Lay Bays	Nil	--	Nil
7	Major Junction	5 Nos.	--	5 Nos.
8	Minor Junctions	57 Nos.	--	57 Nos.
9	Total Major Bridges	1 Nos.	--	1 Nos.
10	Total Minor Bridges	13 Nos.	--	13 Nos.
11	Total Pipe Culverts	134 Nos.	--	*139 Nos.
12	Total Box/ Slab Culverts	52 Nos.	--	*53 Nos.

* Minor bridges, HPC and Box/Slab extra are constructed as per site requirement.
**2 Bus shelters were descoped and one yet to be constructed.

3.2 Typical Cross Section (TCS) Schedule:

The Concessionaire has followed the Typical Cross Section Schedule, shown below as per Schedule B of CA during the Construction.

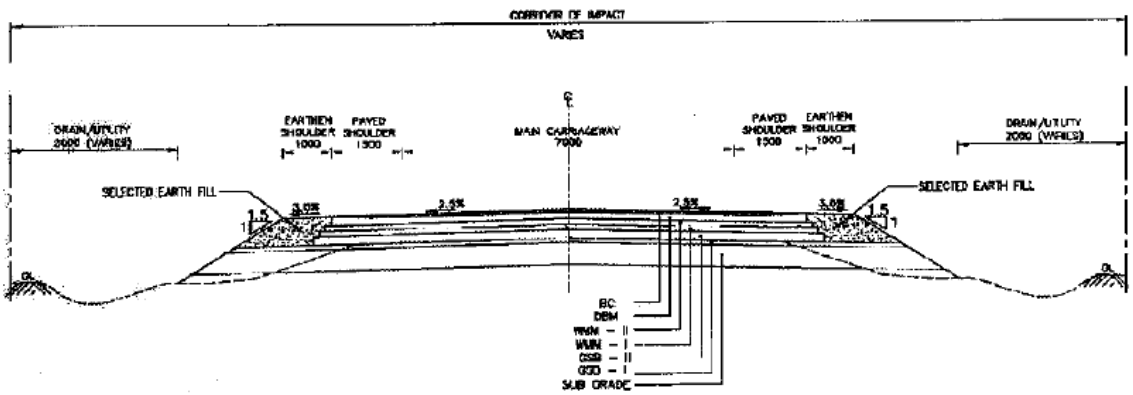

Figure 3.1: (TCS A) of Schedule of CA – Rural Cross Section with Paved Shoulder

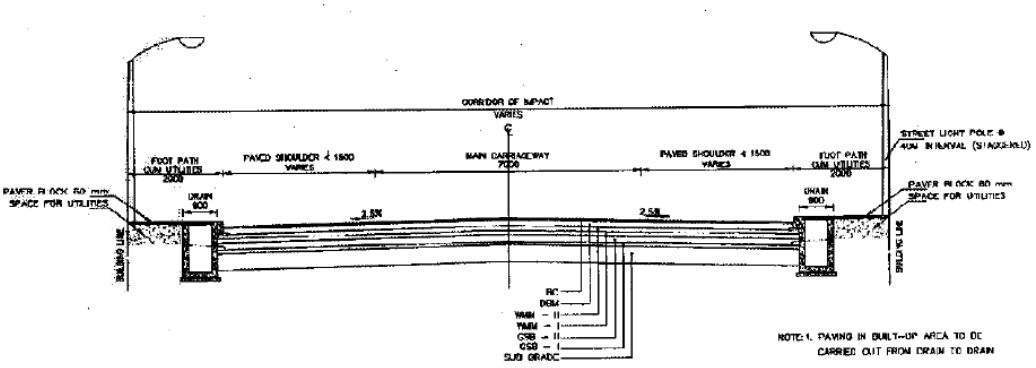

Figure 3.2: ((TCS B) of Schedule of CA - 2 LANE Carriageway With Paved Shoulder In-built up Area

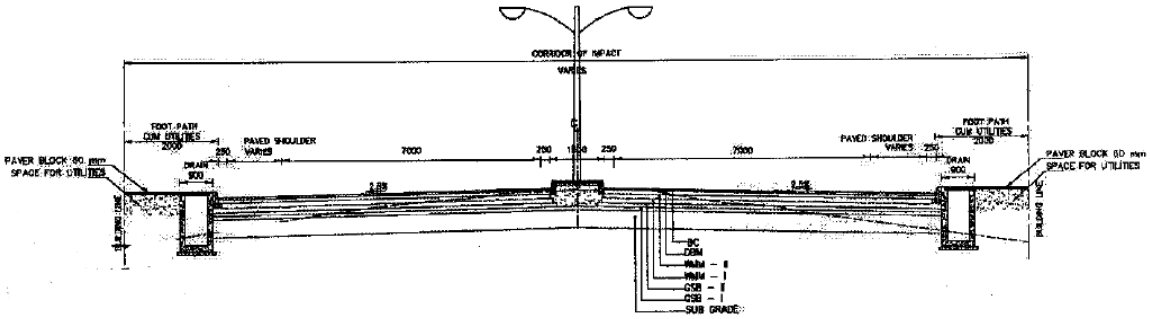

Figure 3.3: (TCS D) of Schedule of CA - 4 Lane Divided Carriageway in urban Area

TCS Schedule is provided below.

Table 3.2: TCS Schedule

Chainage (Km.)		Length (Kms.)	Type of TCS
From	To		
Hassan Arakalgud			
1+120	1+400	280	A
1+400	1+860	460	B
1+860	4+830	2970	A
4+830	5+650	820	B
5+650	7+610	1960	A
7+610	8+200	590	B
8+200	14+200	6000	A
14+200	14+800	600	B
14+800	22+330	7530	A
22+330	22+500	170	B
22+500	23+200	700	D
23+200	24+800	1600	A
24+800	25+150	350	B

Chainage (Km.)		Length (Kms.)	Type of TCS
From	To		
25+150	26+570	1420	A
26+570	26+900	330	B
26+900	28+330	1430	A
28+330	29+488	1158	B
Arakalgud Ramanathaputa			
0+000	0+158	158	A
0+158	0+220	62	B
0+220	0+750	530	D
0+750	1+100	350	A
1+100	1+400	300	B
1+400	3+710	2310	A
3+710	4+085	375	B
4+085	7+270	3185	A
7+270	8+650	1380	D
8+650	10+570	1920	A
10+570	11+170	600	B
11+170	12+590	1420	A
12+590	12+800	210	B
12+800	16+400	3600	A
16+400	17+048	648	B
Ramanathapura Periypatna			
0+000	3+600	3600	A
3+600	3+900	300	B
3+900	5+120	1220	A
5+120	5+270	150	B
5+270	6+850	1580	A
6+850	7+550	700	B
7+550	10+120	2570	A
10+120	10+550	430	B
10+550	12+540	1990	A
12+540	13+700	1160	B
13+700	15+430	1730	A
15+430	15+950	520	B
15+950	17+300	1350	A
17+300	17+450	150	B
17+450	19+900	2450	A
19+900	20+050	150	B
20+050	21+100	1050	A
21+100	21+350	250	B
21+350	22+100	750	A
22+100	22+700	600	B
22+700	24+050	1350	A

Chainage (Km.)		Length (Kms.)	Type of TCS
From	To		
24+050	24+300	250	B
24+300	25+050	750	A
25+050	25+950	900	B
25+950	27+900	1950	A
27+900	28+274	374	B

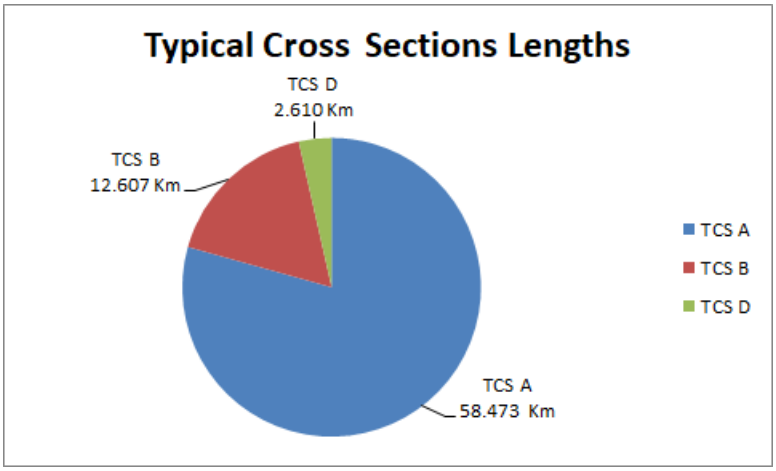

Figure 3.4: Pictorial Diagram of TCS Lengths.

3.3 Road Side Drainage

- To facilitate quick disposal of storm water from the Carriageway and to avoid accumulation of drainage from the Carriageway, side drains are constructed along the main carriageway on both flanks as specified in Schedule B of CA in strict adherence to the Standard Specifications set forth in Schedule D of CA.
- The Concessionaire has provided RCC covered drains with footpath in built up areas while earthen drains are in open and rural areas.

3.4 Service Roads

Service road is not proposed along the entire stretch of the project road as per provisions of Schedule B of CA.

3.5 Bypass/Realignment

There are two realignments proposed on the project road as per provisions of Schedule B of CA are given below.

Table 3.3: List of Realignments

S. No.	From (Km.)	To (Km.)	Length in m.
Link 54A Hassan to Arkalgud			
1	8+250	8+450	200
2	23+400	23+850	450

3.6 Intersections

As per provisions of Schedule B of CA, 5 Major Junctions and 56 Minor Junctions are provided. Details are given below.

Table 3.4: List of Junctions

S. No.	CHAINAGE (Km.)	SIDE	MAJOR/ MINOR
LINK 54A HASSAN ARKALGUD			
1	1+120	BOTH	Major
2	4+045	RHS	Minor
3	4+225	LHS	Minor
4	4+690	LHS	Minor
5	4+950	RHS	Major
6	5+560	BOTH	Minor
7	5+755	LHS	Minor
8	6+400	RHS	Minor
9	6+560	LHS	Minor
10	6+710	LHS	Minor
11	7+085	RHS	Minor
12	7+630	LHS	Minor
13	8+250	LHS	Minor
14	9+840	RHS	Minor
15	11+940	LHS	Minor
16	14+585	LHS	Minor
17	15+150	RHS	Minor
18	16+240	RHS	Minor
19	17+720	LHS	Minor
20	19+255	LHS	Minor
21	20+245	RHS	Minor
22	20+350	RHS	Minor
23	21+715	RHS	Minor
24	22+190	BOTH	Minor
25	22+250	LHS	Minor
26	23+680	LHS	Minor
27	26+680	LHS	Minor
28	27+960	RHS	Minor
29	28+380	RHS	Minor
30	29+488	BOTH	Major
LINK 54B ARKALGUD RAMANATHAPURA			
1	0+780	RHS	Minor
2	2+785	RHS	Minor
3	2+810	LHS	Minor

S. No.	CHAINAGE (Km.)	SIDE	MAJOR/ MINOR
4	5+070	RHS	Minor
5	7+405	RHS	Minor
6	8+615	BOTH	Minor
7	9+000	LHS	Minor
8	9+650	LHS	Minor
9	10+560	LHS	Minor
10	12+925	RHS	Minor
11	14+330	LHS	Minor
12	14+775	RHS	Minor
13	15+515	LHS	Minor
LINK 54C RAMANATHAPURA PERIYAPATNA			
1	5+210	BOTH	Minor
2	6+885	LHS	Minor
3	7+025	RHS	Minor
4	9+360	RHS	Minor
5	8+175	LHS	Minor
6	10+370	RHS	Minor
7	11+750	BOTH	Minor
8	12+955	BOTH	Major
9	13+395	LHS	Minor
10	15+015	RHS	Minor
11	16+405	RHS	Minor
12	18+100	LHS	Minor
13	19+990	RHS	Minor
14	20+050	LHS	Minor
15	22+385	BOTH	Minor
16	27+950	LHS	Minor
17	25+350	RHS	Minor
18	25+180	LHS	Minor
19	28+274	BOTH	Major

3.7 Grade Separated Structures and underpasses

No Grade Separated Structures and underpasses are proposed as per provisions of Schedule B of CA.

3.8 Road Over Bridge (ROB)

No ROB is proposed in the project road as per provisions of Schedule B of CA.

3.9 Carriageway Details

Table 3.5: Summary of Carriageway Details

`	Description	Flexible (Km.)	Rigid (Km.)	Remarks
1	Total Length of 2 lane (Flexible)	71.080 Kms.		
2	Total Length 4 lane	2.610 Kms.		
3	Total Length of the Project	73.690 Kms.		
4	TYPE OF ALIGNMENT			
	New Alignment			
	Realignment	0.650 Kms.		Km.8+250-Km.8+450 & Km.23+400-Km.23+850 in Link 54A Hasan to Arkalguda
S No.	**Description**	**Flexible (km)**	**Rigid (km)**	**Remarks**
	Strengthening	---	---	
	Reconstruction	73.040 Km.	---	
	Total Length of the Project	73.690 Km.	---	

3.10 Summary of Bridges and Culverts:

Table 3.6: Summary of Structures as per Schedule B of CA

S.No.	Description	Count
1	Major Bridges	1 No.
2	Minor Bridges	13 Nos.
3	Hume Pipe Culverts	134 Nos.
4	Slab Culverts	52 Nos.

3.11 Toll Plazas

Table 3.7: Summary of Toll Plazas:

S.No.	Section NO /Link	Proposed Chainage
1	I/54A	Km 17+100
2	II/54B	Km 11+700
3	III/54C	Km 16+520

- There are three toll Plazas on the project road at Link-54A, Link-54B & Link-54C.
- Toll Plaza 1 at Link-54A comprises of 4 lanes.
- Only one lane in each direction is operational and the second lane is used as bike lane.
- Toll Plaza 2, which is at Link-54B, comprises of four lanes.
- Only one lane in each direction is operational and the third lane is used as bike lane.
- Toll Plaza 3, which is at Link-54C, comprises of four lanes.
- Only one lane in each direction is operational and the third lane is used as bike lane.
- Toll plazas at 54B and 54 C are under construction. Toll plaza at 54 A not constructed.

3.12 Bus/Bay shelters:

As per provisions of Schedule C of CA, bus bays/shelters are provided at 28 locations. Details are provided below.

Table 3.8: List of Bus Bay with shelters

S.No.	Chainage (km.)	Side	TYPE
LINK 54A HASSAN ARKALGUD			
1	3+300	LHS	Bus Bay with Shelter
2	3+700	RHS	Bus Bay with Shelter
3	11+840	LHS	Bus Shelter
4	11+925	RHS	Bus Shelter
5	17+300	LHS	Bus Bay with Shelter
6	17+650	RHS	Bus Bay with Shelter
7	18+450	LHS	Bus Bay with Shelter
8	18+530	RHS	Bus Bay with Shelter
9	21+380	RHS	Bus Bay with Shelter
10	21+480	LHS	Bus Bay with Shelter
11	25+360	RHS	Bus Bay with Shelter
12	25+251	LHS	Bus Bay with Shelter
LINK 54B ARKALGUD RAMANATHAPURA			
1	5+820	RHS	Bus Bay with Shelter
2	5+870	LHS	Bus Bay with Shelter
3	7+100	RHS	Bus Bay with Shelter
4	7+200	LHS	Bus Bay with Shelter
5	12+400	LHS	Bus Bay with Shelter
6	12+500	RHS	Bus Bay with Shelter
7	14+380	RHS	Bus Bay with Shelter
8	14+800	LHS	Bus Bay with Shelter
LINK 54C RAMANATHAPURA PERIYAPATNA			
1	7+950	RHS	Bus Bay with Shelter
2	8+000	LHS	Bus Bay with Shelter
3	9+600	LHS	Bus Bay with Shelter
4	9+750	RHS	Bus Bay with Shelter
5	18+300	LHS	Bus Bay with Shelter
6	18+400	RHS	Bus Bay with Shelter
7	25+280	LHS	Bus Shelter
8	25+380	RHS	Bus Shelter

3.13 Other Project Facilities Provided as per Schedule C of CA

- Roadside furniture: Sign Boards Kilometer stones, Road Marking and object/hazard markers are provided in accordance with IRC-SP: 73-2007.
- Traffic safety devices: W Beam Crash barriers, parapet walls are provided as per the provisions of Schedule C of CA.
- Landscaping: Provided at Toll Plaza location and being maintained
- Tree Plantation: Tree plantation is provided on both sides of the Project Corridor all along the way and is being maintained.
- Medical Aid Post: Provided at Toll Plaza location and is operational
- Highway Lighting: Highway lighting is provided at Toll Plaza and is functional.

Km. 1+120 Link-A

Km. 27+597 of Link-C

Km. 7+800 Link-B Bus Bays

Figure 3.5 Representative Photographs of Existing Road Features

CHAPTER 4. ROAD INVENTORY & PAVEMENT CONDITION

4.1 General

Road Inventory and pavement condition surveys were carried out by a team of Engineers and the features noted at site are presented in the sections below:

4.2 Road Inventory

Inventory of the project road was carried out physically and the same is summarized in the following table. Few representative photographs are given below at the end of the Chapter.

Table 4.1: Road Inventory

S. No.	Features	Remarks
1.	Terrain	Plain Terrain
2.	Land Use	Mostly Agriculture
3.	Earthen shoulder	1 m to 1.5 m Width on site
4.	Junctions	62 No.
5.	Toll Plaza	03 Nos.
6.	Sign boards	Sign boards are provided as per requirement
7.	Road Markings	Lane markings are provided as per requirement
8.	Street Lighting	Highway lighting provided as per requirement

4.3 Pavement Condition

Pavement condition survey was carried out on the project road based on observations supplemented by simple measurements. The criteria adopted for the classification of condition of the pavement is as per 4.2.1 of IRC 81-1997.

Table 4.2: Pavement Condition Classification

Classification	Pavement condition
Good	No cracking, rutting less than 10mm
Fair	No cracking or cracking confined to single crack in the wheel track with rutting between 10mm and 20mm.
Poor	Extensive cracking and/or rutting greater than 20mm sections with cracking exceeding 20% shall be treated as failed.

Assessment of the condition of Pavement surface is a key component of infrastructure asset management. The information used across a wide range of business processes which includes: Monitoring the performance of the road; Predicting future pavement conditions and assessing long term needs; Identifying rehabilitation and maintenance treatment options; investigate causes of pavement deterioration and evaluating specific treatment options; The purpose of the pavement condition survey is to provide a more accurate and detailed investigation of the pavement deterioration in order to assist in determining appropriate rehabilitation treatments.

4.4 Pavement Condition Survey methodology

The survey on general pavement condition was primarily undertaken by means of slow drive- over survey and supplemented with measurements wherever necessary. Pavement assessment was done with the help of simple instruments using measuring tape, Straight edge. It was carried out to quantify pavement deficiency on a representative basis. Aspects of pavement condition assessment include surface defects, rut depth, cracking, potholes, patched areas, shoulder conditions etc. An overall assessment of performance serviceability of the road was also done to rate the existing pavement and shoulder condition qualitatively.

The pavement condition was measured under the following sub-heads:

- Shoulder- (Composition/Condition)
- Riding Quality (Good/Fair/Poor/Very Poor)
- Pavement Condition-
  - Cracking (% of Surface area)
  - Ravelling (% of Surface area)
  - Potholes (% of Surface area)
  - Patching (% of Surface area)
  - Rut depth (Moderate 10 to 20 mm & Severe >20 mm)
  - Pavement edge drop (mm)
- Road side Drain (Non-Existing/ Partially Functional/ Functional)

Upon verification of the Pavement condition in the above said manner, it is observed that the Pavement condition of Project road is good. The field measurements of the Pavement Condition survey are tabulated in the standard proforma as per IRC: SP 19 and is given in **ANNEXURE 1**. The summary of Pavement condition is given below.

Table 4.3: Pavement condition summary

From (Km.)	To (Km.)	Length (kms.)	Condition
0+000	73+430	73.430	Good

Km. 7+800 Link-B

Km. 17+040 Link-B

Km. 11+400 Link-C

Km. 11+600 Link-C

Figure 4.1: Representative Photographs of Pavement Condition

CHAPTER 5. INVENTORY AND CONDITION OF STRUCTURES

5.1 General Assessment and Condition of the Existing structures

Inspection of existing structures on the project section was carried out, detailed inventory and condition is examined during the site visit as per the guidelines provided in IRC SP: 52-1999 & IRC SP: 35-1990.

5.2 Inventory of Structures

The details of the structures along this project road.

Table 5.1: List of Structures

S.No.	Type of Structure	Numbers
1	Major bridges	1 Nos.
2	Minor Bridge	13 Nos.
3	Pipe culverts	139 Nos.
4	Slab/Box Culverts	53 Nos.

For major bridge the superstructure is of PSC T beam and RCC T beam supported on RCC circular type piers and wall type abutments resting on open/pile foundations. For some minor bridges the superstructure is RCC solid slab and the substructures are of RCC/PCC conventional wall type abutment and pier resting on open foundations. Also, there are some RCC box type minor bridges. Detailed inventory and condition survey of bridges are given in **ANNEXURE 2.** The culverts observed along the project road are mainly of two types viz. pipe culverts and RCC slab/box culverts. Structural condition of most of the culverts is fair except in few locations. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3.**

5.3 Details of Major Bridges

There details of Major bridge along the project stretch is given below. The total length of the bridge is 140.0m with 2 spans of 22.0m and 3 spans of 32.0m. The superstructure is of PSC T beam and RCC T beam. The substructure is of RCC Circular type piers and wall type abutments resting on Open/pile foundations. Elastomeric/Neoprene bearings are used. Expansion joints are of Strip seal type and RCC Crash barrier has been provided.

Table 5.2: List of Major Bridges

S.No.	Chainage (Km)	Span	Total Length of Bridge (m)
1	23+611	2x22+3x32	140.0

The condition of the superstructure and substructure is good. Certain minor maintenance operations such as quadrant pitching, reflector plates, drainage spouts and strip seal expansion joints are to be carried out.

Figure 5.1 Overall view of the Major Bridge at Km 23+611

5.4 Details of Minor Bridges

The details of minor bridges in the project stretch are listed below. The type of superstructure for minor bridges is RCC solid slab and the substructure is PCC/RCC conventional wall type abutment and pier resting on open foundations. Expansion joints are buried type and bearings are tar paper and neoprene bearings. RCC crash barriers are provided on all structures.

Table 5.3: Inventory of Minor Bridges

S. No.	Chainage	Span	Total Length of Bridge (m)	Description
Hassan-Arakalgud				
1	15+358	1x8.5	8.5	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
2	22+251	1x20.2	20.2	MNB has PSC T Beam superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
3	24+808	1x6.0	6.0	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
Arakalgud-Ramanathapura				
1	9+089	1x9.3	9.3	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
2	13+726	1x9.0	9.0	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
3	14+261	1x6.6	6.6	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.

S. No.	Chainage	Span	Total Length of Bridge (m)	Description
J. Hosahalli-Piriyapatna				
1	0+942	2x4.5	9	It has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
2	5+556	1x9.1	9.1	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
3	7+312	1x9.2	9.2	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
4	9+535	1x8.7	8.7	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.
5	12+000	3x3.0	9.0	It has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
6	20+262	4x3.0	12.0	It has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
7	27+597	2x10.1	20.2	MNB has RCC solid slab superstructure supported on conventional PCC/RCC wall type piers and abutments resting on open foundations. Buried type expansion joints.

Km. 9+089 link-B

Km. 0+942 Link-C

Figure 5.2: Representative photographs of Minor bridges

5.5 Details of Culverts

The culverts observed along the project road are mainly of two types' viz. RCC Slab/Box culverts and Pipe culverts. The condition of culverts is generally good. For some of the pipe culverts vegetation and vent cleaning is required. In general, the condition of all the structures is found satisfactory. The detailed condition of the same are given the following sections. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3.**

5.5.1. General description of the Slab/Box Culverts

There are 53 Nos. of slab / Box culverts in the project stretch. The details of the culverts are as given below.

Table 5.4 List of Slab/Box Culverts

Sl. No.	Chainage	Span (m)	Vent Size (m)
Hassan-Arakalgud road			
1	5+926	1x2	1.40
2	7+922	1x2	1.9
3	13+804	1x3	3.0
4	14+464	1x2	2
5	14+912	1x2	2
6	14+963	1x2	2
7	15+691	1x1.5	1.5
8	21+288	1x2	2
9	22+078	1x2	2
10	23+975	1x3	2.1
11	24+665	1x2	1.2
12	24+941	1x2	1.2
13	27+492	1x2	1.5
14	28+200	1x2	1.8
15	28+819	1x2	1.8
16	28+950	1x2	1.8
17	29+045	1x2	1.8
Arakalgud-Ramanathapura road			
1	0+215	1x1.5	1.5
2	1+250	1x1.5	1.5
3	1+466	1x1.5	1.5
4	2+861	1x1.5	1.5
5	3+570	1x1.5	1.5
6	4+160	1x1.5	1.5
7	5+175	1x1.5	1.5
8	9+437	1x1.8	1.2
9	9+601	1x1.5	1.5
10	9+634	1x3.8	1.0
11	10+578	1x1.5	1.5
12	11+598	1x1.5	1.5
13	12+829	1x1.5	1.5
14	14+568	1x2.3	2.3
15	15+210	1x1.5	1.5
16	16+398	1x1.5	1.5
J. Hosahalli-Piriyapatna Road			
1	0+416	1x1.5	1.5
2	3+538	1x1.5	1.5

Sl. No.	Chainage	Span (m)	Vent Size (m)
3	5+053	1x1.5	1.5
4	5+205	1x1.5	1.5
5	5+217	1x0.7	0.8
6	5+565	1x2	2
7	6+602	1x5.2	2
8	7+312	1x6	2.1
9	7+588	1x1.5	2.2
10	8+344	1x1.8	2
11	8+810	1x1.5	1.2
12	9+715	1x1.5	1.5
13	10+211	1x1.5	1.5
14	11+146	1x1.5	1.5
15	11+329	1x1.5	1.5
16	11+623	1x1.5	1.5
17	12+160	1x1.5	1.5
18	12+347	1x1.5	1.5
19	23+911	1x1.5	2.1
20	26+557	1x0.9	1.2

The general condition of above Box/slab culverts is good. Maintenance is to be carried out before monsoon for vent clearance, Protection works etc.

Km. 28+950 Link-A

Km. 2+861 Link-B

Km. 12+829 Link B

Km. 5+217 Link-C

Figure 5.3: Representative photographs of Slab culverts

5.5.2. General description of the Pipe Culverts

The details of pipe culverts in the project stretch are listed below.

Table 5.5 List of Pipe Culverts

S.No.	Chainage	Span
Hassan-Arakalgud road		
1	1+210	1x1.2
2	2+538	1x1.2
3	3+184	1x1.2
4	3+640	1x1.2
5	4+124	1x1.2
6	6+391	1x0.9
7	6+475	1x0.9
8	6+869	1x0.9
9	7+149	1x0.9
10	7+249	1x0.9
11	7+612	1x1.2
12	8+582	1x1.2
13	8+881	1x1.2
14	9+164	1x0.9
15	9+879	1x1.2
16	10+636	1x1.2
17	10+781	1x1.2
18	10+866	1x1.2
19	11+130	1x1.2
20	11+800	1x1.2
21	12+145	1x1.2
22	12+260	1x1.2
23	12+362	1x1.2

S.No.	Chainage	Span
Arakalgud-Ramanathapura road		
1	0+750	1x1.2
2	0+920	2x0.9
3	1+525	1x0.6
4	1+893	2x0.9
5	2+449	1x0.6
6	2+638	1x0.6
7	3+258	1x1.2
8	4+414	1x0.6
9	4+335	1x0.9
10	4+850	1x1.2
11	5+700	3x0.9
12	6+241	1x1.2
13	6+490	1x1.2
14	7+540	1x1.2
15	8+147	1x1.2
16	9+823	2x1.2
17	10+093	1x1.2
18	10+266	1x0.9
19	10+478	1x0.9
20	11+053	1x0.9
21	11+395	1x0.9
22	11+563	1x1.2
23	12+033	1x1.2

S.No.	Chainage	Span
J. Hosahalli-Piriyapatna road		
1	0+011	3x1.2
2	0+321	1x0.9
3	0+893	1x1.2
4	0+984	1x1.2
5	2+072	1x1.2
6	2+631	1x1.2
7	3+242	3x0.9
8	4+092	4x0.9
9	4+492	1x0.45
10	4+840	2x0.9
11	6+720	1x1.2
12	8+232	2x1.2
13	9+352	2x1.2
14	9+370	1x1.2
15	10+870	1x1.2
16	11+047	4x1.2
17	11+456	1x1.2
18	12+805	1x1.2
19	13+036	1x1.2
20	13+380	1x1.2
21	13+952	1x0.9
22	14+763	2x0.9
23	15+520	1x0.9

S.No.	Chainage	Span
Hassan-Arakalgud road		
24	12+446	1x1.2
25	12+789	1x1.2
26	13+121	1x0.9
27	13+269	2x0.9
28	13+333	1x0.9
29	13+496	1x1.2
30	14+121	1x0.9
31	15+476	1x1.2
32	16+198	1x0.9
33	16+523	1x0.9
34	16+870	1x1.2
35	17+213	1x1.2
36	17+694	1x1.2
37	17+859	1x1.2
38	17+900	1x1.2
39	18+476	1x1.2
40	18+660	1x1.2
41	18+750	1x1.2
42	19+228	1x1.2
43	19+370	1x1.2
44	19+769	1x1.2
45	20+081	1x1.2
46	20+586	1x1.2
47	20+712	1x1.2
48	23+229	2x1.2
49	23+790	1x1.2
50	24+058	1x1.2
51	24+604	1x1.2
52	25+100	1x1.2
53	25+156	1x1.2
54	25+499	1x1.2
55	25+870	1x1.2
56	26+334	1x1.2
57	26+968	1x1.2
58	27+798	1x1.2

S.No.	Chainage	Span
Arakalgud-Ramanathapura road		
24	13+234	1x1.2
25	13+828	1x1.2
26	14+243	2x1.2
27	14+352	1x0.6
28	14+591	1x1.2
29	14+646	1x1.2
30	14+736	1x0.3
31	15+041	1x1.2
32	15+281	1x0.9
33	15+533	1x1.2
34	16+071	1x1.2
35	16+579	1x1.2

S.No.	Chainage	Span
J. Hosahalli-Piriyapatna road		
24	15+871	1x1.2
25	15+945	1x0.9
26	16+585	1x0.9
27	18+089	3x1.2
28	18+600	3x1.2
29	19+127	1x0.9
30	19+877	1x1.2
31	20+077	1x1.2
32	20+525	1x0.6
33	20+716	1x1.2
34	20+867	1x0.9
35	21+026	1x1.2
36	21+916	4x0.9
37	23+150	1x1.2
38	24+978	2x1.2
39	25+691	1x1.2
40	26+700	1x0.45
41	27+352	1x1.2
42	27+714	1x0.45
43	27+835	1x1.2
44	28+022	1x0.9
45	28+122	1x1.2
46	28+158	3x0.9

The general condition of above pipe culverts is good. Maintenance is to be carried out before monsoon for vent clearance, Protection works etc.

Km. 2+072 link-C

Km. 11+047 Link-C

Figure 5.4: Representative photographs of Pipe Culverts

The culverts are in fair condition and can be retained in the present condition with following repairs/rehabilitation measures.

- Chocked culverts must be cleared.
- Debris and garbage near outside the vents must be removed.

CHAPTER 6. PAVEMENT DESIGN VALIDATION AND OVERLAY SCHEDULES

6.1 General

Review of Pavement design report, providing insights on design life of pavement, crust thickness, history of overlays over the existing pavement etc., Based on pavement condition and CA provisions recommendation for the upcoming renewal cycles.

6.2 Pavement design validation

The flexible pavement has low flexural strength and hence layers reflect the deformation of the lower layers / sub-grade on to the surface layer after the withdrawal of wheel load. In order to control the deflections in the sub-grade so that no permanent deflections result, the pavement thickness is so designed that the stresses on the sub-grade soil are kept within its bearing capacity. Loading of bituminous pavement requires the stiffest layers to be placed at the surface with successive weaker layers down to sub-grade.

The project road is already operational and the standards applicable during the design development phase of the project road are taken into account for this review. Therefore, the design of pavement has been validated based on IRC: 37-2012 publication while the current publication is IRC: 37-2018.

6.2.1. Pavement design crust thickness

The new pavement shall be designed in accordance with the IRC:37. “Guidelines for the Design of Flexible Pavements”. Rigid pavement shall be designed in accordance with the method prescribed in IRC:58. “Guidelines for the Design of Plain Jointed Rigid Pavements for Highways”.

The project road has been divided into 3 sections i.e. Link A (from Hassan km. 32+100 to Arkalgud km. 60+400, Link B (from Arkalgud km. 61+475 to Ramanthapura km. 78+025) and Link C (from Hasahalli km. 81+660 to Periyapatna km. 111+840). The design traffic as per traffic during design stage and design traffic as per CA is summarized below.

Table 6.1: Design traffic summary

S. No.	Location	As per traffic surveys		As per Appendix II of schedule B,	
		10 years MSA (Bituminous layer)	15 years MSA (Non-Bituminous layer)	10 years MSA (Bituminous layer)	15 years MSA (Non-Bituminous layer)
1	Km. 47+930	2.72	5.02	5.13	8.63
2	Km. 72+290	2.38	4.38	3.24	5.53
3	Km. 100+135	1.14	2.11	1.5	2.53

As seen, the actual traffic is less than schedule MSA in Appendix B-II of CA, pavement has been design for 10 MSA and 10% effective CBR, Pavement crust thickness in the pavement design report for flexible pavement is as follows: -

Table 6.2: Flexible Pavement Design summary

S. No.	Description/ Pavement layer	Design/Adopted Parameters
1	Sub Grade CBR (%)	10%
2	Design Life (Years)	10 years for bituminous 15 years for granular
3	Design Traffic (MSA)	10 MSA
4	Surface course (BC)	40mm
5	Binder course (DBM)	50 mm
6	Base course (WMM)	250 mm
7	Sub Base course (GSB)	2000 mm

Pavement crust thickness in the pavement design report for rigid pavement is as follows: -

Table 6.3: Rigid Pavement Design for Toll Plaza

Description	Design/Adopted Thickness
CBR of sub grade	10 %
Design life in years	30
Pavement Quality Concrete (PQC) – (mm)	280
Dry Lean Concrete (DLC) – (mm)	150
Drainage Layer (GSB) - (mm)	200
Diameter of Dowel Bar (mm)	32
Length of Dowel Bar (mm)	500
Spacing of Dowel Bars (mm)	300
Diameter of Tie Bar (mm)	12 (Deformed)
Length of Tie Bar (mm)	640
Spacing of Tie Bars (mm)	480

The Pavement crust has been designed according to IRC specification and found in order, the adopted/ Constructed pavement layer thickness is adequately provided than actual/designed thickness.

6.3 Overlay during operation and maintenance

The pavement has been designed to cater traffic of 10 MSA (up to 2032), whereas the actual traffic is 2.53 to 8.63 MSA. This implies that pavement will be structurally adequate to cater the future traffic with periodic renewal carried out under the maintenance program.

However, as per clause 2.3.7 of Schedule K of CA, periodic renewal shall be carried out as and when required and at least once between 5th or 7th year (from COD) within the concession period, the periodic maintenance activities shall also include profile corrective course overlaid with the periodic renewal of the wearing course of BC 25 mm thickness of the road pavement, the concessionaire may adopt cost effective treatment like asphalt recycling, stone mastic, micro seal etc.

Based on the present available data It is envisaged that existing pavement require overlay (periodic renewal) in the year of 2025. Nevertheless, the pavement shall be maintained to the desired level of performance by carrying out periodical renewals as mentioned in subsequent sections.

6.3.1. Maintenance/ Overlay schedule

Periodic Maintenance shall be carried out as and when required based on the road condition and at least once between 5th and 7th year (from COD) and in the last year of Concession period as a good industry practice. It includes Profile corrective course overlaid with the periodic renewal of the wearing course of BC. The detail maintenance schedule is summarized below.

Routine maintenance - Every year
Periodic Renewal for Flexible Pavement – Next periodic Renewal Proposed on or before 2025
Periodic Maintenance for Rigid Pavement – Re-texturing shall be done at least once in 10 years from construction

CHAPTER 7. SAFETY AUDIT OF ROAD

7.1 General

Road Safety Audit (RSA) is defined as "the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users".

Road Safety is a multi- sectorial and multi- dimensional issues. It incorporates the development and management of road infrastructure, provisions of safer vehicles, legislations and law enforcements, mobility planning, provisions of health and hospital services, child safety, urban land use planning.

A Key feature of a road safety audit is the use of a team of professionals with varied expertise. The team shall include highway safety engineers, highway design engineers, maintenance personal, and law enforcement. Additional specialties shall be added to the team as needed.

Central Road Research Institute (CRRI) has studied road safety elements extensively in the past and has come up with various manuals such as manual for safety in road design (1998), Road safety Audit Manual (2003) and Revised Road Safety Audit manual (2010). Indian Road Congress (IRC) has published Special provision SP-88, Manual on road Safety Audit. The methodology used for the design stage audit process is based on these manuals like Type Designs for Intersections on National Highways, 1992.

Table 7.1: Referred IRC Publications

IRC Code No.	IRC Code Name
IRC: 35	Code of Practice for Road Markings
IRC: 38	Guidelines for Design of Horizontal curves for highways and Design tables
IRC: 67	Code of Practice for Road signs
IRC: 73	Geometric Design standards for rural highways (non-urban)
IRC:103	Guidelines for Pedestrian Facilities
IRC: SP-15	Ribbon Development along highways and its prevention
IRC: SP-23	Vertical curves for highways
IRC: SP-41	Guidelines on design of at-grade intersections in Rural and Urban areas
IRC: SP-55	Guidelines for safety in construction zones
IRC: SP- 88	Manual of Road Safety

7.2 Existing Road Safety Audit

During the site visit, it is observed that all safety items are provided as shown in the following table

Table 7.2: Safety Items

S. No.	Item Description		Status	Condition
Road Furniture				
1	Sign Boards	Chevron Signs Village sign boards Information Boards	Available as per site requirement	Good

S. No.	Item Description		Status	Condition
		Other Sign Boards Gantry Sign Boards		
2	Road Marking	Studs &Lane marking	Available as per site requirement	Fair
3	Metal Beam Crash Barriers	At High embankments	Available as per site requirement	Fair

This Project Section is part of an important corridor. It is the Concessionaire's duty and responsibility to provide safe road for the commuters by assuring safe and hindrance free movement for both Traffic and Pedestrians along urban locations & habitations.

Km. 5+926 Link-A

MBCB & Chevron signs in link-B

Km. 23+000 Link-C

Figure 7.1 Representative photograph of during road safety audit

7.3 Conclusion

Safety arrangements are made for road users along the Project road are found to be in conformity with project road requirements and good industry practice. However, a continuous monitoring on safety arrangements is required during the maintenance period.

CHAPTER 8. TOLL PLAZA & HTMS

8.1 General

There are three toll Plazas on the project road at Link-54A, Link-54B & Link-54C. Toll Plaza 1 at Link-54A comprises of 4 lanes. Only one lane in each direction is operational and the second lane is used as bike lane. Toll Plaza 2, which is at Link-54B, comprises of 4 lanes. Only one lane in each direction is operational and the third lane is used as bike lane. Toll Plaza 3, which is at Link-54C, comprises of 4 lanes. Only one lane in each direction is operational and the third lane is used as bike lane.

8.2 Tolling Equipment and Control Room Equipment

List of equipment provided at toll plaza and control room is given below.

Table 8.1 : List of lanes Equipment at Toll Plaza and Control Room

S No.	Item Description	Qty.
Lane Equipment		
1	TOLL LANE CONTROLLER	12
2	TOLL COLLECTOR KEYBOARD QWERTY TVS	8
3	AVC SENSORS INCLUDING (TMS & HTMS)	12
4	THERMAL PRINTER	8
5	LANE INCIDENT CAPTURE CAMERA	9
6	TRAFFIC LIGHT (TMS & HTMS)	9
7	OVERHEAD LANE SIGNALS(300 MM DIA)	7
8	USER FARE DISPLAY 2- LINES,12-CHARACTER	9
9	INTERCOM SLAVE UNIT AI PHONES NEM-10/C	12
10	LANE EXIT BARRIER WITH LOOPS & DETECTOR	8
11	BARCODE READER (TMS & HTMS)	8
12	T & G SMART CARD READER SPECTRA/ HID	12
13	MANUAL BOOTH CONTROLLER (TMS & HTMS)	12
14	10 KVA ONLINE UPS WITH 30 MINS BACKUP	2
Control Room		
15	CABLING/NETWORKING FOR LANE (TMS & HTMS)	2
16	SERVER RACKVALRACKMODUC AB WAN	2
17	TMS SERVER (TMS & HTMS)	2
18	CASHU UP/AUDIT WORKSTATION LENOVO	4
19	POS T & G SMART CARD READERSPECTRA	2
20	THERMAL PRINTER	2
21	6 KVA ONLINE UPS WITH 30 MINS BACKUP	2
22	REL DATABASE MANAGMENT SYSTEM - TMS	2
23	WINDOWS SERVER 2016 R2 STANDARD EDITION	2
24	ANTIVIRUS (TMS & HTMS)	20
25	SEMI AUTOMATIC LANE SOFTWARE	12
26	SEMI AUTOMATIC PLAZA SOFTWARE WITH ADMIN	2
27	INTERCOM MASTER UNIT - 20 CHANNEL (TMS)	2

8.3 Vehicles

The list of vehicles, which were observed at site, for operation of Highway and Toll Plaza are presented below.

Table 8.2 List of Vehicles

S. No.	Vehicle Type	No.
1	Patrol Vehicle	3
2	Ambulance	3

Toll Plaza-Link-B

Toll Plaza Link-C

Toll Plaza Building-Link-B

Figure 8.1 Representative Photograph of Toll Plaza

CHAPTER 9. SCHEDULE OF ANNUITY PAYMENTS

9.1 Hybrid Annuity Model (HAM)

Hybrid annuity model is the PPP model, which allows the payment of Lumsum amount during construction period based on progress milestones set forth by Authority to Concessionaire and Balance amount in the form of Annuity to the Concessionaire Bi-annually with the Interest during the balance concession period.

In this HAM model, as per Cl. 27.5 Lump sum payment is given in four installments during the construction phase as below.

Installment No	Amount in Rs. (Crores)	% Progress during construction
First	22.193	25
Second	22.193	50
Third	22.193	75
Fourth	22.193	On COD

9.2 Schedule of Annuity Payments

As per 27.2.2, the concessionaire upon achieving COD, Authority agrees to pay Rs. 26.28crores as per schedule –M.

Table 9.1: Schedule of Annuity Payments

S No.	Particulars	Annuity Due date	Payment Paid on
1	1st Annuity	28.03.2019	28-Mar-19
2	2nd Annuity	29.09.2019	6-Feb-20
3	3rd Annuity	28.03.2020	30-Mar-20
4	4th Annuity	29.09.2020	19-Nov-20
5	5th Annuity	28.03.2021	
6	6th Annuity	29.09.2021	
7	7th Annuity	28.03.2022	
8	8th Annuity	29.09.2022	
9	9th Annuity	28.03.2023	
10	10th Annuity	29.09.2023	
11	11th Annuity	28.03.2024	
12	12th Annuity	29.09.2024	
13	13th Annuity	28.03.2025	
14	14th Annuity	29.09.2025	
15	15th Annuity	28.03.2026	
16	16th Annuity	29.09.2026	

CHAPTER 10. OPERATION AND MAINTENANCE

10.1 General

As per Article 17 of CA, the Concessionaire will operate and maintain the Project roads by itself or through O & M Contractors and comply with specification and standards, and other requirements set forth in the Agreement, Good Industry Practice, Applicable Laws, applicable permits and manufacturer guidelines.

10.2 Inspection

Inspection system followed is illustrated as divided into the following 3 types.

- **Visual Inspection:** Visual inspections are done at frequent intervals, and are intended to determine any potential traffic hazards to the road user or hampering the aesthetics of the project stretch. Visual Inspections are meant to identify defects that constitute an imminent or immediate hazard to the public.

- **Detailed Inspection:** Detailed Inspections often require some measuring instruments, are done less frequently and are intended more towards determining performance and behavior of various elements. These inspections also indicate if there is any need for thorough inspections. Detailed inspections are carried out primarily to establish programs of periodic or major maintenance tasks, and enhancement requirements not requiring urgent execution

- **Thorough Inspection:** Thorough Inspections are aimed at finding the cause and remedy of specific problems and at specific locations. Specialist's inspections are required once in a while. Thorough Inspections shall be carried out with highly sophisticated instruments

The inspection procedures will assist in identifying the need for replacement or renewal under planned program of maintenance and rehabilitation. The elements viz. pavement, drainage, shoulders / slopes / Earthworks, structures and buildings are covered.

Maintenance program will be submitted to authority not later than 45 days prior to each accounting year.

10.3 Operations

Traffic Flow Operation & Traffic Management Plan

Following are the obligations of the Concessionaire for the regular and emergency operations of the Project road and Project Facilities.

1 Permitting smooth and uninterrupted flow of traffic during normal operating conditions.
2 carrying out preventive and periodic maintenance of the Project road;
3 Undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;
4 Undertaking major maintenance such as resurfacing of pavements, repairs to structures;
5 Functioning of the lighting system;
6 Functioning of the Patrolling System

7 Functioning of rescue and medical aid services
8 Ambulance as and when required
9 Functioning of the Project Facilities
10 Administrative, Operational and Maintenance Base Camp
11 Truck Lay byes
12 Pickup Bus stops / Bus Bays
13 Protection of the environment and provision of equipment and materials therefor;
14 Operation and maintenance of all communication, control and administrative systems necessary for the efficient operation of the Project road
15 Complying with Safety Requirements in accordance with Article 18.

10.4 Operation of Toll Plazas

There are two lanes in each direction operating at toll plaza, middle lanes are used by Car/LCV for collecting toll and extra wide lanes are utilized by wide vehicles like Bus/Trucks/Tractors and toll exempted vehicles. The cash collected is deposited on daily basis to the Escrow Account. In case of ETC system, Toll collection is connected with Network system and directly deposited into the Escrow account.

10.5 Maintenance of Project road

The maintenance methodology and yearly maintenance programme will guide the Maintenance team to undertake the routine & periodic maintenance works of the Project Facilities. This programme is the basic indicator of the intended works to be carried out by the Maintenance Team over a period of one year.

i. Road maintenance can be carried out in four ways as listed below.
ii. Preventive Maintenance
iii. Routine Maintenance
iv. Periodic Maintenance
v. Special repairs

Preventive Maintenance

Preventive maintenance is an organized, systematic process of applying a series of preventive treatments over the life of the pavement to minimize life cycle costs.

The strategy of applying periodic treatments at appropriate times in a pavement's life is economical than applying treatment at the end of pavement's life. Preventive maintenance is designed to retard pavement deterioration. Regular preventive maintenance will be carried out to ensure adherence to the Design Requirements and specifications throughout the Concession period.

The flexible pavement is in good condition and hence does not require any immediate or preventive interventions.

Routine Maintenance

Routine maintenance, which involves repairing of cracks, replacement of safety girders along the highway, clearance of debris following accidents, ensuring functionality of sign posts, maintenance of a security set-up, and such other activities.

Periodic Maintenance

In contrast to preventive maintenance treatments, periodic maintenance treatments are ideally applied on pavements to improve surface integrity and waterproofing, or to improve skid resistance, without increasing the strength of the pavement significantly. They are sometimes referred to as "functional overlays," as they are intended to restore or enhance the ability of the roadway to serve its purpose (function), but do not increase the load-carrying capabilities. If the pavement failure is more and demands for a "structural overlay" they are intended to increase load-carrying capabilities of the project road. The details of periodic maintenance schedule are given below.

Table 10.1 Schedule and status of for Periodic Maintenance

Description	Schedule of Major Maintenance	Status of Major Maintenance
Periodic Maintenance	2025	Planned to execute

Special Repairs

The group of activities performed to restore the roadway following damage due to natural calamities such as heavy floods, sand storms, hurricanes, cyclones, earthquakes or landslides which shall be unpredictable. The affected Project road shall be rectified, and the system shall be restored to function as per programme prepared in consultation with Independent Engineer. Typical activities include,

a. Culvert and bridge repairs
b. Retaining wall repairs and construction;
c. Construction of Diversions;
d. Floodway repairs; and
e. Flood damage restoration works, etc.

10.6 Review of Test Reports

Bump Integrator Test:

Maintenance of road is dependent on several factors, one of which is the condition of Pavement surface. As such Roughness is the measurement of the riding quality, which in turn is the effect of total surface deterioration. Bump Integrator (BI) is one of the equipment needed for roughness measurement. The roughness of pavement surface is designated as uneven index value and expressed as surface roughness from which the condition of the road can be assessed.

The test was conducted in the month of Aug, 2020. As per Schedule K of CA, if the stretch exceeds 2000mm in a KM shall be rectified. No stretch exceeds the permissible limit.

Benkelman Beam Deflection (BBD):

The performance of flexible pavement is closely related to the elastic deflection of pavement under the wheel loads. The deformation or elastic deflection under a given load depends upon subgrade soil type, its moisture content and compaction, the thickness and the quality of pavement courses, drainage conditions, pavement surface temperatures etc. BBD method is widely followed to evaluate the structural capacity of pavement and for estimation and design of overlay for strengthening of any weak pavement.

Concessionaire has conducted the test in Feb 2020. The test report has been verified and found within permissible limits as per IRC 81.

Environmental Quality Monitoring

In Aug 2020, Concessionaire has conducted Ambient air quality test, Noise quality test, Water quality test and soil quality test in accordance with Schedule L. The values are within the permissible limits.

10.7 O&M Forecast

The O&M costs were estimated based on various parameters of CA, design reports and BBD/BI test results. The cost summary is given below, and detailed cost estimations are given in **ANNEXURE 5.**

Table 10.2: Proposed Plan for Future Operation & Maintenance Cost (In Crores)

Year	Routine maintenance	Incidental maintenance	Periodic / Major maintenance	Operational Expenses	Total cost per year
	(In crores)	(In crores)			
2020	0.313	0.447		1.776	2.536
2021	0.322	0.461		1.829	2.612
2022	0.332	0.474		1.884	2.690
2023	0.342	0.489		1.940	2.771
2024	0.352	0.503	25.730	1.999	28.584
2025	0.363	0.518	26.440	2.059	29.380
2026	0.374	0.534		2.120	3.028
2027	0.191	0.273		1.083	1.547
Total	**2.589**	**3.699**	**52.170**	**14.690**	**73.148**

CHAPTER 11. REVIEW OF CONCESSION AGREEMENT

11.1 General: Scope of Project (Article 2)

Article 2 provides the scope of work which includes the following.

- Construction of the Project Highway on the Site set forth in schedule B and C and in conformity with the Specifications and Standards (Schedule D) and Schedule L;
- Operation and maintenance of the Project Highway in accordance with the provisions of this Agreement
- Performance and fulfilment of all other obligations of the Concessionaire in accordance with the provisions of this Agreement and matters incidental

11.2 Letter of Award

After evaluation of the bids received, Authority will select one bidder considering their score in technical and financial bids. Further Authority will issue a Letter called LOA (Letter of Award) to the selected bidder requiring the execution of agreement within stipulated time. The issued LOA copy given in **ANNEXURE 5.**

11.3 Conditions precedent (Article 4):

Conditions precedent to be fulfilled by the Authority:

- Providing adequate Right of Way
- Providing necessary approvals as per the Concession Agreement

Conditions precedent to be fulfilled by the Concessionaire:

- Provide performance security to the Authority
- Executed and procured Escrow Agreement & Substitution Agreement
- Procured all applicable permits specified in Schedule A
- Executed financing Agreements and delivering 3 copies of Financial Package
- Delivered to the Authority confirmation in original of the correctness of their representations and warranties set forth in Agreement and a legal opinion from the legal opinion from the legal counsel of the Concessionaire

11.3.1. Performance Security (Article 9):

- The Concessionaire shall submit the Performance security to the Authority within 120 days from the date of the Agreement,
- The Performance security shall remain in force throughout the Construction period
- Performance Security shall be released on Commercial Operation Date.

11.3.2. Tests (Clause 13.3)

For determining that the Project, conforms to the Maintenance Requirements, the Independent Engineer shall require the Concessionaire (Concessionaire shall in turn require the Contractor) to carry out, or cause to be carried out, tests specified by it in accordance with Good Industry Practice. One half of the costs incurred on such tests, and to the extent certified by the Independent Engineer as reasonable, shall be reimbursed by the Authority to the Concessionaire

11.4 Provisional Completion Certificate (Clause 14.3)

Upon completion of works in accordance with the specifications and standards set forth in the Schedule B, C and D of CA after determining the tests on completion successful the Independent engineer shall issue the Completion Certificate in the form set forth in Schedule J of CA.

A copy of PCOD attached in the **Annexure-6.**

11.5 Completion Certificate (Clause 14.4)

Upon completion of Punch list items appended to the Provisional Completion Certificate within 90 days of issuance of Provisional Complete Certificate, Completion Certificate shall be issued to the Concessionaire.

11.6 Commercial Operation Date (COD) (clause 15.1)

- COD shall be the date on which the Provisional Completion Certificate is issued by the Independent Engineer.
- With COD the Project shall enter into commercial service and the Concessionaire is entitled to demand and collect Fee.

11.7 Change of scope (Article 16)

Change of scope proposals that were initiated during construction period and consented by the KRDCL are provided at **Annexure 8**.

11.8 O&M Obligations of the Concessionaire (Clause 17.1)

- Permitting safe, smooth and uninterrupted flow of traffic on the Project road
- Collecting and appropriating the Fee
- Minimizing the disruption to traffic in the event of accidents
- Undertaking routine maintenance including prompt repairs of pot holes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices
- Undertaking major maintenance such as resurfacing of pavements.
- Preventing any unauthorized use of the Project road.
- Protection of environment and provision of equipment and materials

11.9 Maintenance Requirements (Clause 17.2)

The Contractor shall procure that at all times during the Operations period; the Project road conforms to the maintenance requirements set forth in Schedule K of CA (The "**Maintenance Requirements**").

11.10 Maintenance Manual (Clause 17.3)

No later than 180 (one hundred and eighty days prior to the Scheduled Two Laning Date, the Contractor shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual (the "**Maintenance Manual**") for the regular and preventive maintenance of the Project in conformity with the Specifications and Standards, Maintenance Requirements, Safety Requirements and Good Industry Practice, and shall provide 5 (five) copies thereof to the Authority and 2 (two)

copies to the Independent Engineer. The Maintenance Manual shall be revised and updated once every 3 (three) years and the provisions of this Clause shall apply, mutatis mutandis, to such revision.

11.11 Maintenance Programme (Clause 17.4)

- On or before COD and no later than 45 days prior to the beginning of each Accounting year during the Operation Period as the case may be the Concessionaire shall provide to the Authority and Independent Engineer its proposed annual Programme of preventive, urgent and the schedule maintenance.
- The Concessionaire has been submitting the Annual Maintenance Programme regularly as per the above clause.

11.12 Damages for breach of Maintenance Obligations (Clause 17.8)

- In the event that the Contractor fails to repair or rectify any defect or deficiency set forth in the Maintenance Requirements within the period specified therein, it shall be deemed to be in breach of the Agreement and the Concessionaire shall be entitled to recover Damages, to be calculated and paid for each day of delay until the breach is cured, at the higher of the following.
- 0.5% (zero decimal five percent) of the Average Daily Fee, and
- 0.1% (zero decimal one per cent) of the cost of such repair or rectification as estimated by the Independent Engineer.

11.13 Monthly status reports (Clause 19.1)

During the Operation Period, the Contractor shall, no later than 7 (seven) days after the close of each month, furnish to the Concessionaire, the Authority and the Independent Engineer a monthly report stating in reasonable detail the condition of the Project including its compliance or otherwise with the Maintenance Requirements, Maintenance Manual, Maintenance Program and Safety Requirements, and shall promptly give such other relevant information as may be required by the Concessionaire, Independent Engineer or the Authority. In particular, such report shall separately identify and state in reasonable detail the defects and deficiencies that require rectification.

11.14 Concession Fee (Article 26)

- In consideration of the grant of Concession, the Concessionaire shall pay Concession Fee of Rs.1.00 per year during the Concession Period
- Concession Fee shall be paid in advance within 90 days of the commencement of the Accounting Year.
- Yearly the Concessionaire is paying the Concession Fee to the MPRDC.

11.15 Change in Law (Article 41)

The Contractor acknowledges that the Contractor shall be responsible for any consequences arising from any Change in Law and the Contractor shall at its own costs and expenses, undertake the compliance with any such Change in Law, however, in the event any receivables are obtained by the Concessionaire from the Authority, towards the losses incurred by the Concessionaire on account of Change in Law, then the Contractor shall ensure that such receivables are passed to the Concessionaire.

CHAPTER 12. INSURANCE

12.1 General

As per clause 32.1 of the CA, the Concessionaire shall effect and maintain at its own cost during the Operation Period such insurances for such maximum sums as may be required under the Financing Agreements and the Applicable laws, and such insurances as may be necessary or prudent in accordance with Good Industry Practice. Copy of Insurances are attached in the **Annexure-7.**

Accordingly, the Concessionaire has procured the following insurances for mitigating the risks

Table 12.1: Insurance Details

Name of the Policy	Insurance Company	Policy No	Effective Period	
			From	To
Civil Engineering Completed Risk	National Insurance Co. Ltd	321300441910001997	27/03/2020	26/03/2021
Electronic Equipment Insurance Policy schedule	Oriental Insurance Company Ltd	171200/44/2021/44	08/09/2020	07/09/2021
Employees Compensation Insurance Policy	HDFC ERGO General Insurance Company Limited	3114203376737300000	18/04/2020	17/04/2021

CHAPTER 13. CONCLUSION

13.1 General

Based on detailed site inspection, review of various documents and reports as described in the preceding chapters technical over view of the Project is provided below.

13.2 Pavement Condition

The Pavement condition for the overall project is good. RCC drains are constructed in Built up locations and earthen drains in rural locations, which facilitate effective drainage system along the project road. Shoulder condition is fair.

13.3 Condition of Structures

General condition of Bridges is good. No major structural defects were noticed. General condition of Culverts is good. Vegetation growth is observed in vents of Box and Hume Pipe culverts and they are being cleared during regular maintenance period.

13.4 Project Facilities

Three Toll Plazas are constructed one at Link I/54A, Link I/54B & Link I/54C. All are operational. Toll Plaza is operated. Bus bays are in fair condition. Avenue plantation. Highway lighting is provided at toll plaza locations and the same is found functional.

13.5 Road safety

Pavement marking is in fair condition and number of sign boards are provided as per IRC SP 73-2007. The condition of signboards & other road appurtenances like metal beam crash barriers is fair.

13.6 Maintenance

A dedicated team is appointed for routine maintenance works and working effectively. Major maintenance (MM) /Periodic maintenance was carried out recently and next MM is scheduled in 2025.

13.7 Epilogue

The project is designed and constructed as per the stipulated specifications besides maintenance work, being carried out timely and effectively to keep the road in traffic worthy and safe at all times.

ANNEXURES

Annexure 1: Pavement Condition

Condition: G=Good, F=Fair, P=Poor & VP=Very poor Rutting: M=Moderate & S=Severe Drain: LD=Lined open Drain, ULD=Unlined Drain, CD=Covered Drain, NO=No drain, PF=Partial Function, F= Functional

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Raveling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)	
SH-54 Link-A																
1+120	2+120								G		E+P	F	F	CD	F	
2+120	3+120								G		E+P	F	F	ULD	F	
3+120	4+120								G		E+P	F	F	ULD	F	
4+120	5+120								G		E+P	F	F	ULD	F	
5+120	6+120	1							G		E+P	F	F	CD	F	
6+120	7+120								G		E+P	F	F	ULD	F	
7+120	8+120								G		E+P	F	F	CD	F	
8+120	9+120								G		E+P	F	F	ULD	F	
9+120	10+120								G		E+P	F	F	ULD	F	
10+120	11+120								G		E+P	F	F	ULD	F	
11+120	12+120								G		E+P	F	F	ULD	F	
12+120	13+120								G		E+P	F	F	ULD	F	
13+120	14+120								G		E+P	F	F	F	F	
14+120	15+120								G		E+P	F	F	CD	F	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Raveling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)	
15+120	16+120								G		E+P	F	F	ULD	F	
16+120	17+120								G		E+P	F	F	ULD	F	
17+120	17+120								G		E+P	F	F	ULD	F	
17+120	18+120								G		E+P	F	F	ULD	F	
18+120	19+120								G		E+P	F	F	ULD	F	
19+120	20+120								G		E+P	F	F	ULD	F	
20+120	21+120								G		E+P	F	F	ULD	F	
21+120	22+120								G		E+P	F	F	ULD	F	
22+120	23+120								G		E+P	F	F	CD	F	
23+120	24+120								G		E+P	F	F	CD	F	
24+120	25+120								G		E+P	F	F	CD	F	
25+120	26+120								G		E+P	F	F	ULD	F	
26+120	27+120								G		E+P	F	F	CD	F	
27+120	28+120								G		E+P	F	F	ULD	F	
28+120	29+488								G		E+P	F	F	CD	F	
SH-54 Link-B																
0+000	0+525								G		E+P	F	F	CD	F	
0+525	1+525								G		E+P	F	F	CD	F	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Raveling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)	
1+525	2+525	1							G		E+P	F	F	ULD	F	
2+525	3+525								G		E+P	F	F	ULD	F	
3+525	4+525								G		E+P	F	F	CD	F	
4+525	5+525								G		E+P	F	F	ULD	F	
5+525	6+525								G		E+P	F	F	ULD	F	
6+525	7+525								G		E+P	F	F	CD	F	
7+525	8+525								G		E+P	F	F	CD	F	
8+525	9+525								G		E+P	F	F	ULD	F	
9+525	10+525	1							G		E+P	F	F	ULD	F	
10+525	11+525								G		E+P	F	F	CD	F	
11+525	12+525								G		E+P	F	F	ULD	F	
12+525	13+525								G		E+P	F	F	CD	F	
13+525	14+525								G		E+P	F	F	ULD	F	
14+525	15+525								G		E+P	F	F	ULD	F	
15+525	17+048								G		E+P	F	F	ULD	F	
SH-54 Link-C																
0+000	0+340								G		E+P	F	F	ULD	F	
0+340	1+340								G		E+P	F	F	ULD	F	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Raveling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)	
1+340	2+340								G		E+P	F	F	ULD	F	
2+340	3+340								G		E+P	F	F	ULD	F	
3+340	4+340								G		E+P	F	F	ULD	F	
4+340	5+340								G		E+P	F	F	ULD	F	
5+340	6+340								G		E+P	F	F	ULD	F	
6+340	7+340								G		E+P	F	F	ULD	F	
7+340	8+340								G		E+P	F	F	ULD	F	
8+340	9+340								G		E+P	F	F	ULD	F	
9+340	10+340								G		E+P	F	F	ULD	F	
10+340	11+340								G		E+P	F	F	CD	F	
11+340	12+340								G		E+P	F	F	ULD	F	
12+340	13+340								G		E+P	F	F	CD	F	
13+340	14+340								G		E+P	F	F	CD	F	
14+340	15+340	1							G		E+P	F	F	ULD	F	
15+340	16+340								G		E+P	F	F	CD	F	
16+340	17+340								G		E+P	F	F	ULD	F	
17+340	18+340								G		E+P	F	F	ULD	F	
18+340	19+340								G		E+P	F	F	ULD	F	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Raveling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)	
19+340	20+340								G		E+P	F	F	CD	F	
20+340	21+340								G		E+P	F	F	ULD	F	
21+340	22+340								G		E+P	F	F	CD	F	
22+340	23+340								G		E+P	F	F	ULD	F	
23+340	24+340								G		E+P	F	F	CD	F	
24+340	25+340	1							G		E+P	F	F	CD	F	
25+340	26+340								G		E+P	F	F	CD	F	
26+340	27+340	1							G		E+P	F	F	CD	F	
27+340	28+274								G		E+P	F	F	CD	F	

Annexure 2: Condition of Bridges

S. No.	Chainage (Km.)	Type of Structure	Sub structure	Super structure	Crash barrier	Expansion Joint	Approach slabs	Drainage spouts	Approaches	Wearing coat	Toe wall
Hassan-Arakalaguda											
1	15+358	MNBR	Good	Good	Good	Fair	Fair		Fair	Fair	Good
2	22+251	MNBR	Good	Good	Good	Good	Fair		Fair	Fair	Good
3	23+611	MJBR	Good	Good	Good	Fair	Good		Fair	Good	Good
4	24+808	MNBR	Good	Good	Good	Good	Fair		Fair	Good	Good
Arakalaguda-Ramnathpura											
1	9+089	MNBR	Good	Good	Good	Good	Good		Good	Good	Good
2	13+726	MNBR	Good	Good	Good	Fair	Good		Good	Good	Good
3	14+261	MNBR	Good	Good	Good	Fair	Good		Good	Good	Good
J.Hoshalli-Periyapatna											
1	0+942	MNBR	Good	Good	Good	-	Fair		Good	Good	Good
2	7+312	MNBR	Good	Good	Good	Good	Fair		Fair	Good	Good
3	9+535	MNBR	Good	Good	Good	Fair	Good		Good	Good	Good
4	12+000	MNBR	Good	Good	Good	-	Good		Fair	Good	Good
5	20+262	MNBR	Good	Good	Good	-	Fair		Good	Good	Good
6	27+597	MNBR	Good	Good	Good	Good	Fair		Good	Good	Good

Annexure 3: Condition of Box /Slab Culverts

S. No.	Chainage (km.)	Box/slab	Return wall	Quadrant pitching	Toe wall	Parapet wall
Hassan-Arakalaguda						
1	5+926	Good	Good	Good	Good	Good
2	7+922	Good	Good	Fair	Good	Fair
3	13+804	Good	Good	Good	Good	Good
4	14+464	Good	Good	Fair	Good	Good
5	14+912	Good	Good	Fair	Fair	Good
6	14+963	Good	Good	Good	Good	Good
7	15+691	Good	Good	Fair	Good	Good
8	21+288	Good	Good	Good	Good	Good
9	22+078	Good	Good	Fair	Good	Good
10	23+975	Good	Good	Good	Good	Good
11	24+665	Good	Good	Fair	Good	Good
12	24+941	Good	Good	Good	Good	Good
13	27+492	Good	Good	Fair	Good	Good
14	28+200	Good	Good	Fair	Fair	Good
15	28+819	Good	Good	Good	Good	Good
16	28+950	Good	Good	Fair	Good	Good
17	29+045	Good	Good	Good	Good	Good
Arakalaguda-Ramanathapura						
1	0+215	Good	Good	Fair	Good	Good
2	1+250	Good	Good	Fair	Good	Good
3	1+466	Good	Good	Fair	Good	Good
4	2+861	Good	Good	Fair	Good	Good
5	3+570	Good	Good	Fair	Good	Good
6	4+160	Good	Good	Good	Good	Good
7	5+175	Good	Good	Good	Good	Good
8	9+437	Good	Good	Fair	Fair	Good
9	9+601	Good	Good	Fair	Fair	Good
10	9+634	Good	Good	Good	Good	Good
11	10+578	Good	Good	Fair	Good	Good
12	11+598	Good	Good	Fair	Fair	Good
13	12+829	Good	Good	Good	Good	Good
14	14+568	Good	Good	Fair	Good	Good
15	15+210	Good	Good	Fair	Fair	Good
16	16+398	Good	Good	Good	Good	Good
J.Hoshalli-Periyapatna						
1	0+416	Good	Good	Fair	Fair	Good
2	3+538	Good	Good	Fair	Fair	Good
3	5+053	Good	Good	Good	Good	Good

S. No.	Chainage (km.)	Box/slab	Return wall	Quadrant pitching	Toe wall	Parapet wall
4	5+205	Good	Good	Fair	Good	Good
5	5+217	Good	Good	Fair	Good	Good
6	5+565	Good	Good	Good	Good	Good
7	6+602	Good	Good	Fair	Good	Good
8	7+312	Good	Good	Fair	Fair	Good
9	7+588	Good	Good	Good	Good	Good
10	8+344	Good	Good	Fair	Fair	Good
11	8+810	Good	Good	Fair	Fair	Good
12	9+715	Good	Good	Fair	Fair	Good
13	10+211	Good	Good	Good	Good	Good
14	11+146	Good	Good	Good	Good	Good
15	11+329	Good	Good	Fair	Fair	Good
16	11+623	Good	Good	Fair	Good	Good
17	12+160	Good	Good	Fair	Good	Good
18	12+347	Good	Good	Fair	Fair	Good
19	18+089	Good	Good	Good	Good	Good
20	26+557	Good	Good	Good	Good	Good

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
Hassan-Arakalaguda					
1	1+210	Good	Good	Fair	Good
2	2+538	Good	Good	Fair	Good
3	3+184	Good	Good	Fair	Good
4	3+640	Good	Good	Fair	Good
5	4+124	Good	Good	Fair	Good
6	6+391	Fair	Good	Fair	Good
7	6+475	Good	Good	Fair	Good
8	6+869	Good	Good	Fair	Good
9	7+149	Good	Good	Fair	Good
10	7+249	Good	Good	Fair	Good
11	7+612	Good	Good	Fair	Good
12	8+582	Good	Good	Fair	Good
13	8+881	Good	Good	Fair	Good
14	9+164	Good	Good	Fair	Good
15	9+879	Good	Good	Fair	Good
16	10+636	Good	Good	Fair	Good
17	10+781	Good	Good	Fair	Good
18	10+866	Good	Good	Fair	Good
19	11+130	Good	Good	Fair	Good
20	11+800	Good	Good	Fair	Good
21	12+145	Good	Good	Fair	Good

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
22	12+260	Fair	Good	Fair	Good
23	12+362	Good	Good	Fair	Good
24	12+446	Good	Good	Fair	Good
25	12+789	Good	Good	Fair	Good
26	13+121	Good	Good	Fair	Good
27	13+269	Good	Good	Fair	Good
28	13+333	Good	Good	Fair	Good
29	13+496	Good	Good	Fair	Good
30	14+121	Good	Good	Fair	Good
31	15+476	Fair	Good	Fair	Good
32	16+198	Good	Good	Fair	Good
33	16+523	Good	Good	Fair	Good
34	16+870	Good	Good	Fair	Good
35	17+213	Good	Fair	Fair	Good
36	17+694	Good	Good	Fair	Good
37	17+859	Good	Good	Fair	Good
38	17+900	Good	Good	Fair	Good
39	18+476	Fair	Good	Fair	Good
40	18+660	Good	Good	Fair	Good
41	18+750	Good	N/A	Fair	Good
42	19+228	Good	Good	Fair	Good
43	19+370	Good	Good	Fair	Good
44	19+769	Good	Good	Fair	Good
45	20+081	Fair	N/A	Fair	Good
46	20+586	Good	Good	Fair	Good
47	20+712	Good	Good	Fair	Good
48	23+229	Good	Good	Fair	Good
49	23+790	Good	Good	Fair	Good
50	24+058	Good	Good	Fair	Good
51	24+604	Good	Good	Fair	Good
52	25+100	Good	Good	Fair	Good
53	25+156	Good	Good	Fair	Good
54	25+499	Good	Good	Fair	Good
55	25+870	Good	Good	Fair	Good
56	26+334	Good	Good	Fair	Good
57	26+968	Good	Good	Fair	Good
58	27+798	Fair	Good	Fair	Good
Arakalaguda-Ramanathapura					
1	0+750	Good	Good	Fair	Good
2	0+920	Good	Good	Fair	Good
3	1+525	Fair	Good	Fair	Good

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
4	1+893	Good	Fair	Fair	Good
5	2+449	Good	Good	Fair	Good
6	2+638	Good	Good	Fair	Good
7	3+258	Good	Good	Fair	Good
8	4+335	Good	Good	Fair	Good
9	4+414	Good	Fair	Fair	Good
10	4+850	Good	Good	Fair	Good
11	5+700	Good	Good	Fair	Good
12	6+241	Good	Good	Fair	Good
13	6+490	Good	Good	Fair	Good
14	7+540	Good	Fair	Fair	Good
15	8+147	Good	Good	Fair	Good
16	9+823	Good	Good	Fair	Good
17	10+093	Good	Good	Fair	Good
18	10+266	Good	Good	Fair	Good
19	10+478	Good	Good	Fair	Good
20	11+053	Good	Good	Fair	Good
21	11+395	Good	Good	Fair	Good
22	11+563	Good	Good	Fair	Good
23	12+033	Good	Good	Fair	Good
24	13+234	Good	Good	Fair	Good
25	13+828	Fair	Good	Fair	Good
26	14+243	Good	Good	Fair	Good
27	14+352	Good	Good	Fair	Good
28	14+591	Good	Fair	Fair	Good
29	14+646	Good	Good	Fair	Good
30	14+736	Good	Good	Fair	Good
31	15+041	Good	Good	Fair	Good
32	15+281	Fair	Good	Fair	Good
33	15+533	Good	Good	Fair	Good
34	16+071	Good	Good	Fair	Good
35	16+579	Good	Fair	Fair	Good
J.Hoshalli-Periyapatna					
1	0+011	Good	Good	Fair	Good
2	0+321	Good	Good	Fair	Good
3	0+893	Good	Good	Fair	Good
4	0+984	Good	Good	Fair	Good
5	2+072	Good	Good	Fair	Good
6	2+631	Good	Good	Fair	Good
7	3+242	Good	Good	Fair	Good
8	4+092	Good	Good	Fair	Good

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
9	4+492	Good	Good	Fair	Good
10	4+840	Good	Good	Fair	Good
11	6+720	Good	Good	Fair	Good
12	8+232	Good	Good	Fair	Good
13	9+352	Good	Good	Fair	Good
14	9+370	Good	Good	Fair	Good
15	10+870	Good	Good	Fair	Good
16	11+047	Good	Good	Fair	Good
17	11+456	Good	Good	Fair	Good
18	12+805	Good	Good	Fair	Good
19	13+036	Good	Good	Fair	Good
20	13+380	Good	Good	Fair	Good
21	13+952	Good	Good	Fair	Good
22	14+763	Good	Good	Fair	Good
23	15+520	Good	Good	Fair	Good
24	15+871	Good	Good	Fair	Good
25	15+945	Good	Good	Fair	Good
26	16+585	Good	Good	Fair	Good
27	18+600	Good	Good	Fair	Good
28	19+127	Good	Good	Fair	Good
29	19+877	Good	Good	Fair	Good
30	20+077	Good	Good	Fair	Good
31	20+525	Good	Good	Fair	Good
32	20+716	Fair	Good	Fair	Good
33	20+867	Good	Good	Fair	Good
34	21+026	Good	Good	Fair	Good
35	21+916	Good	Good	Fair	Good
36	23+150	Good	Good	Fair	Good
37	23+911	Good	Good	Fair	Good
38	24+978	Good	Good	Fair	Good
39	25+691	Good	Good	Fair	Good
40	26+700	Good	Good	Fair	Good
41	27+352	Good	Good	Fair	Good
42	27+714	Good	Good	Fair	Good
43	27+835	Good	Good	Fair	Good
44	28+022	Good	Good	Fair	Good
45	28+122	Good	Good	Fair	Good
46	28+158	Good	Good	Fair	Good

Annexure 4: O&M Costs

S No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
1	General Cleaning in Carriageway & Shoulders Rural area	Monthly	Km	73.69	12	4	350	12,37,992	04 nos of Labour
2	General Cleaning in Carriageway & Shoulders Urban area	Twice in a month	kms	2.61	24	4	350	87,696	04 nos of Labour
3	Watering in Median Plants	Once in Week	Km	2.61	52	1	1939	2,63,161	01 nos of Labour
4	Watering in Avenue plants	Once in Week	Km	0	52	0	1939	-	
5	Median Maintenance (Grass cutting and plant trimming)	Once in Month	Km	2.61	12	0	21000	-	02 nos of Labour - 2 x 350 = 700 x 30 = 2,52,000
6	ROW Cleaning	Half yearly	Km	36.845	2	5	350	1,28,958	5 Nos of labour per KM (50% of the Project length)
7	Cleaning of Culverts	Half yearly	Nos	192	2	2	650	4,99,200	3 nos of Labour along with JCB or Excavator
8	Road Furniture Cleaning	Quarterly	Km	73.69	4	2	350	2,06,332	02 nos of Labour
9	Maintenance of Bus shelters	Monthly	Nos	25	6	2	350	1,05,000	2 nos/ Bus shelter/month
10	General Cleaning in Building & Facilities	Daily	Nos	3.00	6	60	350	3,78,000	02 nos of Labour for 30 days
11	Bridges	Half yearly	Nos	12	2	2	350	16,800	02 nos of Labour for removal of vegetation/Structure
								29,23,139	
	EQUIPMENT SUPPLY							-	
1	TRUCK TIPPER 6-8 CUM CAPACITY	Monthly	Nos	1	12	3	10000	30,000	Considered Rs 10,000/- per

S No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
									vehicle including maintenance
2	Water Tanker Cap 12 KL for Median	Monthly	Nos	2.6	12	0	440000	-	(2200000 is the cost of vehicle, considering 20% Rental per year) including maintenance
3	Tractor Mounted Water tanker Cap 6 KL for RoW	Monthly	Nos		12		160000	-	(800000 is the cost of vehicle, considering 20% Rental per year) including maintenance
4	Mechanical Sweeper	Monthly	Nos		12		500000	-	(2500000 is the cost of vehicle, considering 20% Rental per year) including maintenance
5	Grass cutter	Monthly	Nos	2.6	12	0	12000	1,566	(12000/year)
6	Manhoise/ Skyscrapper	Monthly	Nos		12		400000	-	(2000000 is the cost of vehicle, considering 20% Rental per year) including maintenance
7	Bikes	Monthly	Nos	2.6	12	0	2500	5,220	Per Supervisor/Per Month
8	Building Maintenance	Yearly			12	3	5000	1,80,000	5000/month
9	Toll plaza AMC	Yearly	Nos		12	3	5000	1,80,000	5000/month
								3,96,786	
1	Patrolling vehicle	Monthly	Nos	12	1	2	10000	20000	Considered Rs 10,000/- per vehicle including maintenance

S No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
2	Ambulance	Monthly	Nos	12		1	10000	10000	Considered Rs 10,000/- per vehicle including maintenance
3	Tow away trucks and Crane	Monthly	Nos	12		2	40000	80000	Considered Rs 40,000/- per vehicle including maintenance
4	Consumables for Medical Aid Post and Ambulance	Monthly	Nos	12		1	2500	30000	2500 Per month for per set (Per set - Per toll plaza)
5	Consumables for Route Patrolling & Crane	Monthly	Nos	12		1	2500	30000	2500 Per month for per set (Per set - Per toll plaza)
								1,70,000	
								34,89,925.00	

Incidental cost

S. No.	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks
1	Road marking	Half yearly	Sqm	1	1	5875	516	30,31,500	33 % of Total Project length on B/S for 1 year
2	Carriageway Maintenance (Pot Holes etc.)	Yearly	Sqm	1	1	1500	168	2,52,000	5% of Flexible Pavement
3	Maintenance of Earthen Shoulder	Half yearly	Cum	1	3	1105.35	225	7,46,111	5% of total Shoulder length throughout the project
4	Sign Board	Quarterly	Km	1	1	25	4000	1,00,000	5 % of Total sign boards per half year (considered 500 nos)

S. No.	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks
5	MBCB	Monthly	RMT			75	2400	1,80,000	5% of Total qty per year - (considered 2400 per number)
6	Mile Stone (KM Stone/ HM Stone / ROW stone etc.)	Quarterly	Nos	73.69	4	18	2250	1,62,000	5 % of total stones per year (unable to understand the backup)
7	ROW Fencing (If available)	Quarterly	Km		4			-	10 % of total ROW fencing per year
8	Kerb	Yearly	Km	5220	1	0.0	250	-	2 % of total Kerbings per year
9	Electrical Poles	Yearly	Nos	0	1	0	55000	-	3 % of total poles per year
10	Replacement of Rigid pavement Panels	Yearly	Ls	1	1	0.00	4000	-	Considered 1% of the total volume
11	Providing Reinforced cement concrete crash barrier at the edges of the bridge structures constructed with M-40 grade concrete with HYSD-Fe 500 TMT reinforcement concrete per Rmt conforming to IRC:21 and fixing with dowel bars 16 mm dia to old concrete using epoxy grout as per drawing and Technical Specifications and as directed by the Engineer.	Yearly	Rmt	0		0.00	3985	-	3% of Length replacement in every 5 years (Quantity to be estimated)
							Total Cost for 1 year	**44,71,611**	

Operational Expenses

S.No.	Particulars	Amount
1	Man Power	₹ 1,37,40,000
2	Fuel for Generator & Vehicles	₹ 42,24,000
3	Electricity	₹ 6,60,000
4	Stationary	₹ 10,000
5	Replacement of Electrical Fixtures	₹ 27,533
6	Refurbishment of Toll Plaza Equipment	₹ 75,000
Total Amount		**₹ 1,87,36,533**

Major Maintenance Summary

Description	Due date	Base cost	Esc Period	Escalation Rate per Year	Cost of MMR on due date @ 3% Escalation	In crores
Date of Estimation	30-01-2021					
Major Maintenance - Highway	01-04-2024	23,47,96,343	3.20	3.0%	25,73,36,791	25.73
Major Maintenance - Highway	01-04-2025	23,47,96,343	4.20	3.0%	26,43,80,682	26.44
				Total	₹ 52,17,17,473	52.17

Major maintenance BOQ

S.no.	Description	Unit	Quantity	Rate	Amount	Quantity	Rate	Amount
	Pavement (Asphalt & Concrete)							
1	Providing and applying tack coat with Rapid Setting Bitumen Emulsion using emulsion pressure distributor on the prepared bituminous/granular surface cleaned with mechanical broom,Ref. to Technical specification 503.			-			-	

S.no.	Description	Unit	Quantity	Rate	Amount	Quantity	Rate	Amount
(a)	On Bituminous surface @ 2.0 kg to 3.0 kg/10 sq.m.	Sqm	7,49,950.00	14.00	1,04,99,300	7,49,950.00	14.00	1,04,99,300
2	Providing and laying bituminous concrete using a batch type Hot Mix Plant using crushed aggregates of size (table 500-17), premixed with VG Grade Bitumen 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, Pneumatic Tyre Rollers to achieve the desired compaction as per Technical specification clause No. 507 and mix design conforming the IRC -111 and IRC 37.	Cum	29,998.00	7,480.00	22,43,85,040	29,998.00	7,480.00	22,43,85,040
3	Providing and laying bituminous concrete using a batch type Hot Mix Plant using crushed aggregates of size	Cum	29,998.00	6,800.00	20,39,86,400	29,998.00	6,800.00	20,39,86,400
4	Micro surfacing	Sqm	-	160.00		-	160.00	
5	Repair of joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete)	MTRS	-	250.00		-	250.00	
6	Texturing of Rigid pavement (considering 50% for 7 years)	Sqm	-	130.00		-	130.00	
	Total				**43,88,70,740**			**43,88,70,740**
	Junctions, Traffic Signs Marking and Other Appurtenances			-			-	
1	Providing and laying of **cement concrete kerb without channel** (M-20 Grade) over WMM foundation using kerb laying machine & proper curing complete, as per drawing & technical specification clause no.409, 1700 and as per the instructions of Employer's	Rmt	5,220.00	380.00	19,83,600	5,220.00	380.00	19,83,600

S.no.	Description	Unit	Quantity	Rate	Amount	Quantity	Rate	Amount
	representative. - **Consider 5% for construction period.**							
2	Providing and laying lane markings of hot applied thermoplastic compound 2.5 mm thick including reflectorizing glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35. The finished surface to be level, uniform and free from streaks and holes, Ref. to Technical specification 803.	Sqm	17,803.33	516.00	91,86,520	17,803.33	516.00	91,86,520
3	Road Studs	Nos	25,434.00	750.00	1,90,75,500	25,434.00	750.00	1,90,75,500
4	Kerb painting		1,905.30	250.00	4,76,325	1,905.30	250.00	4,76,325
	Total			-	**3,07,21,945**		-	**3,07,21,945**
	Grand Total				**46,95,92,685**			**46,95,92,685**

Annexure 5: Letter of Award

KARNATAKA ROAD DEVELOPMENT CORPORATION LTD.

KRDCL/WCP3/ LOA /2015-16 1907 Date: 11-09-2015

To
M/s Dilip Buildcon Limited,
Plot No. 5, Inside Govind Narayan Singh Gate,
Chuna Bhatti, Kolar Road,
Bhopal (M.P.) - 462 016

Kind Attn: Mr. Dilip Suryavanshi
Email: db@dilipbuildcon.co.in

LETTER OF AWARD

Sir,

Sub: "Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Existing State Highway Hassan - Ramanathapura - Periyapatna in the State of Karnataka on DBFOMT Annuity Basis (**WCP-3**)"– Letter of Award (LoA)

Ref.: (i) RFP issued on 10th April 2015
(ii) Your bid submitted on June17th, 2015

This is to notify that your bid submitted for the captioned project (the "Project") for a semi-annual annuity quote of Rs 26,28,00,000 (Rupees Twenty Six Crore and Twenty Eight Lakh only) is hereby accepted by the Government of Karnataka by declaring you as the "Selected Bidder". The concession period is 10 (ten) years including construction period of 24 (twenty four) months.

1. The semi-annual annuity quoted by you shall be disbursed in accordance with the provisions of Draft Concession Agreement (DCA).

2. Lumpsum Payment of Rs 88,77,20,000 (Rupees Eighty Eight Crore, Seventy Seven Lakh and Twenty Thousand only) shall be disbursed in accordance with the provisions of Draft Concession Agreement (DCA) in four equal instalments.

3. In accordance with the clause 3.3.2 of the Project RFP Document, you are hereby requested to confirm your acceptance of this Letter of Award within 7 days of its receipt by signing and returning the duplicate copy of the LOA in acknowledgement thereof. Thereafter, pursuant to clause 1.3 of the Project RFP Document, you are required to execute the Concession Agreement within 45 days from the issue of LoA.

4. You shall promote and incorporate the Concessionaire as a limited liability company under the Companies Act 1956/2013 as applicable, as the entity which shall undertake and perform the obligations and exercise rights of the Bidder under the LoA, including the obligation to enter into the Concession Agreement pursuant to the LoA for executing the Project.

Annexure 6: Provisional Completion Certificate

PROVISIONAL COMPLETION CERTIFICATE

1. I, **Raj Mallela**, acting as Independent Engineer, under and in accordance with the Concession Agreement dated 16th December 2015 (the "**Agreement**"), on Design, Build, Finance, Operate ,Maintain and Transfer (DBFOMT) the State Highway Hassan - Ramanathapura - Periyapatna in the State of Karnataka on DBFOMT Annuity Basis, through DBL Hassan Periyapatna Tollways Limited, hereby certify that the Tests specified in Article 14 and Schedule-I of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.
2. Construction Works that were found to be incomplete and/or deficient have been specified in the Punch List appended hereto, and the Concessionaire has agreed and accepted that it shall complete and/or rectify all such works in the time and manner set forth in the Agreement. Some of the incomplete works have been delayed as a result of reasons attributable to the Authority or due to Force Majeure and the Provisional Certificate cannot be withheld on this account. Though the remaining incomplete works have been delayed as a result of reasons attributable to the Concessionaire, I am satisfied that having regard to the nature and extent of such incomplete works, it would not be prudent to withhold commercial operation of the Project Highway, pending completion thereof.
3. In view of the foregoing, I am satisfied that the 71.940 km out of the total 73.690 km of Project Highway can be safely and reliably placed in commercial service of the Users thereof, and in terms of the Agreement, the Project Highway is hereby provisionally declared fit for entry into commercial operation on this the 28th day of February 2018.

ACCEPTED SIGNED, SEALED AND DELIVERED

For and on behalf of CONCESSIONAIRE by:

(Authorized Signature)
DBL Hassan Periyapatna Tollways Limited, (DHPTL)

Address: Plot No. 5, Inside Govind Narayan Singh Gate, Chuna Bhatti, Kolar Road, Bhopal, Madhya Pradesh 462016

SIGNED, SEALED AND DELIVERED

For and on behalf of INDEPENDENT ENGINEER by:

(Independent Engineer)
Roughton International Ltd in Association with SATRA Infrastructure Management Services Pvt Ltd

Address: H. No. 3-43-119, Plot No. 10 Wellington Road, Lalitha Nagar West Marredpally, Secunderabad 500 026 Telangana

Annexure 7: Insurance

Signer: ATUL JERATH
Date: Thursday, S[illegible] 24, 2020 5:50 AM
Location: NOIDA

ELECTRONIC EQUIPMENT INSURANCE POLICY SCHEDULE

Policy No	: **171200/44/2021/44**	**Prev Policy No**	:
Cover Note No	: ER1700203537	Cover Note Dt	: 08/09/2020
Insured's Code	: 114936584	Issuing Office Code	: 171200
Insured's Name	: DBL Hassan Periyapatna Tollways Pvt Ltd (GSTIN: 29AAFCD5002K1ZP)	Issuing Office Name	: CBU Vadodara (GSTIN: 24AAACT06
Address	: NO.77,, BEHIND RMP QUARTERS, 5TH STAGE, KUVEMPUNAGARA,MYSORE, Karnataka, 570023	Address	: Ist FLOOR, KIRTI TOWER, TILAK ROAD VADODARA GUJARAT 390001
Tel /Fax /Email	: HASSAN[illegible]@unisoninsurance.net	Tel /Fax /Email	: 0265-2427075 / 0265-2436654 / 171200@orientalinsurance.co.in

Agent/Broker Details

Dev.Off.Code :
Agent/Broker : **LC0000000179 (1149)UNISON INSURANCE BROKING SERVICES P LTD**
Address : **601-602 ,6TH FLOOR AURAM NR VASNA,HP PETROL PUMP MARKAND DESAI RAOD VADODARA 390015 GUJARAT INDIA,MOB NO 9898295111 PHONE NO 0265-2252274,BARODA,GUJARAT,396007**
Tel/Fax/Email : **0265-2252274/0265-2357445/0265-2356033/**

Period of Insurance : FROM 00:00 ON 08/09/2020 TO MIDNIGHT OF 07/09/2021

Collection No & Dt : DC_I_INDCSH 3214000876 - 23/09/2020 GST INVOICE NO :2419502804 UIN :0

Gross Premium : 2,906 GST : 523 Stamp Duty : 1 Total : 3,429

RISK DETAILS

Section I : EEI - EQUIPMENT

Sum Insured : 64,55,872

1 Location of the Risk : AS PER LIST ATTACHED
Road and bridge stretch connecting from Hassan to Periyapatna

KARNATAKA - 573201

Sl No.	Description of Items	Manufacturer Name	Year of Manufacture	Annual Maintenance Contract	Identification No	Escalation %	Sum Insured
1	AS PER LIST	AS PER LIST	2018		AS PER LIST		64,55,872

Deductible / Excess for : AS PER LIST ATTACHED

Excess :

(a) For equipment with value upto Rs. 1 lakh
1) For PC : 5% of claim amount subject to minimum of Rs.2500/-
2) For Equipment other than PC :
(i) Equipment (other than Winchester Drive and/or Hard Disc)- 5% of claim amount subject to a minimum of Rs.1000/-
(ii) Winchester Drive and/or Hard Disc-10% of claim amount subject to a minimum of Rs.2500/-

(b) For equipment with value more Rs. 1 lakh -
1) Equipment (other than Winchester Drive) - 5% of claim amount subject to a minimum of Rs.2,500/-

Place : -
Date : 22/09/2020

For and on behalf of
The Oriental Insurance Company Limited

This is an electronically generated document (Policy Schedule).The Policy document duly stamped will be sent by post.

In case of any query regarding the Policy please call Toll Free No. 1800 11 8485 and 011 33208485.

Authorised Signatory

CIN: U66010DL1947GOI007158 All the Amounts mentioned in this policy are in Indian Rupee Page 1 of 2

IRDA Regn. No. 556 - Now you can buy and renew selected policies online at www.orientalinsurance.org.in

पॉलिसी अनुसूची/ Policy Schedule - Civil Engineering Completed Risk

Policy Number:
321300441910001997

जारीकर्ता कार्यालय/Issuing Office

कार्यालय कोड /Office Code: 321300

कार्यालय पता /Office Address: BHOPAL DIVISION II B-8, Indrapuri, B H E L, Bhopal, Madhya Pradesh - 462022.
State Code: 23 , Madhya Pradesh
GSTIN: 23AAACN9967E1Z9
Contact Number: 755 2682822
eMail: 321300@nic.co.in
Mobile Number:

व्यवसाय स्रोत/Business Source: 910355

मध्यस्थ चैनल कोड/Sales Channel Code: 9103550000001

नाम /Name: Aspire Insurance Brokers Pvt Ltd - HO Contact Number: 8291914810

सह दलाल कोड / Co Broker Code:

Customer Care Toll Free Number:
1800 345 0330
email:customer.support@nic.co.in

ग्राहक का नाम /Customer Name: DBL HASSAN PERIYAPATNA TOLLWAYS LTD

पता/ Address: NO-77, BEHIND RMP QUARTERS,5TH STAGE, KUVEMPUNAGARA, MYSORE-570023, City: MYSORE, District: MYSORE, State: KARNATAKA, PIN: 570023.
Cell: 9826292328

ग्राहक आईडी /Customer ID: 9701881851

फोन /Phone:

ई-मेल /E-Mail:

पैन /PAN: AAFCD5002K

पॉलिसी: 27/03/2020 के 00:00 से 26/03/2021 की मध्य रात्रि तक प्रभावी /Policy Effective from 00:00 hours, on 27/03/2020 to midnight of 26/03/2021

प्रीमियम/ Premium	₹ 23,29,466.00	कवर नोट संख्या और तिथि/ Cover Note Number and Date	NA
CGST	₹ 0.00		
SGST/UTGST	₹ 0.00		
IGST	₹ 4,19,304.00		
केरल बाढ उपकर/Kerala Flood Cess	₹ 0.00	प्रस्ताव संख्या और तिथि/Proposal Number and Date	8800200327087117 Dt. 27/03/2020
कम:जीएसटी_टीडीएस / Less:GST_TDS	₹ 0.00		
पुनर्प्राप्त योग्य स्टाम्प ड्यूटी /Recoverable Stamp Duty	₹ 0.00	रसीद संख्या और तिथि/Receipt Number and Date	32130081191000766 Dt. 27/03/2020
कुल /Total Amount	₹ 27,48,770.00	पिछली पॉलिसी संख्या और समाप्ती तिथि/ Previous Policy Number and Expiry Date	NA

(Rupees Twenty Seven Lakh Forty Eight Thousand Seven Hundred Seventy Only.)
Location:Existing State Highway Hassan - Ramanathapura - Periyapatna, Karnataka Hassan, Hassan - District Others, 573101.

Sr.No	Type of Risk	Description Of Risk	Earthquake Zone	Sum Insured of the risk(₹)	Excess(₹)
1	Roads	ROAD AND STRUCTURE	Zone IV	2,21,35,00,000.00	1,00,000.00
2	Roads	Road Furniture, Fixtures, Electrical Poles Lighting & Fittings, Signboard & Safety Barrier	Zone IV	11,65,00,000.00	1,00,000.00

लागू खंडों,पृष्ठांकनों एवं वारंटी / Clauses, Endorsements and Warranties Applicable:Agreed Bank Clause, Terrorism Damage Exclusion Warranty, Riot, Strike, and Malicious Damage Clause, Policy is subject to following conditions : POLICY IS SUBJECT TO THE FOLLOWING CONDITIONS:

1.Excess applicable under the policy is: (a) Upto SI of Rs 500 Cr = 10% of Claim subject to Minimum of Rs 5 lacs & (b) SI above 500 Cr & upto 1500 Cr = 10% of Claim subject to Minimum of Rs 10 lacs. Entire Road package will be treated as One location for application of Excess.
2 Policy is Applicable for Roads & Road side structures & Toll plazas & Bridges & Flyovers on Land.
3.No Coverage for (Road) Transportaion Tunnels
4.No Coverage for Marine Vessel Impact Damage.
5.Each 72 hour period will be treated as One occurrence/event for STFI & EQ for application of Excess.

PROJECT DETAILS COVERED UNDER THE POLICY AS FOLLOWS:
Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Existing State Highway Hassan - Ramanathapura - Periyapatna in the state of Karnataka on DBFOMT Annuity Basis (WCP-3)

Name of the co insured under the policy is Dilip Buildcon Ltd. & KRDCL.
Name of the contractor under the policy is Dilip Buildcon Ltd and subcontractor is VARIOUS.

Printed on 27/03/2020 by ID: 75159

Page no: 1

HDFC ERGO General Insurance Company Limited

April 15, 2020

DILIP BUILDCON LIMITED

PLOT NO. 5, GOVIND NARAYAN SINGH GATE,
CHUNA BHATTI, BHOPAL,MADHYA PRADESH,
BHOPAL,
MADHYA PRADESH,462016.

Dear Customer,

Sub: Employees Compensation Insurance Policy No: 3114203376737300000

We thank you for having preferred us for your *Insurance* requirements. We at HDFC ERGO General Insurance believe "***Insurance***" as not only to be an assurance to indemnify in the event of unfortunate circumstances, but one that signifies protection and support, which you can count on when you need it most.

The Insurance Policy enclosed herewith is a written agreement providing confirmation of our responsibility towards you that puts insurance coverage into effect against stipulated perils.

Please note that the policy has been issued based on the information contained in the proposal form and / or documents received from you or your representative / broker.

Name of the Intermediary	:	GLOBAL INSURANCE BROKERS PVT LTD
Intermediary Code	:	200113159601

Where the proposal form is not received, information obtained from you or your representative /broker, whether orally or otherwise, is captured in the policy document.

If you wish to contact us in reference to your existing policy and /or other general insurance solutions offered by us, you may write to our correspondence address as mentioned below. Alternatively, you may visit our website www.hdfcergo.com . To enable us to serve you better, you are requested to quote your Policy Number in all correspondences.

Thanking you once again for choosing HDFC ERGO General Insurance Company Limited and looking forward to many more years of association.

Yours sincerely,

Authorised Signatory

3114203376737300000 Page 1 of 13

HDFC ERGO General Insurance Company Limited (Formerly HDFC General Insurance Limited) | CIN : U66030MH2007PLC177117 | Registered & Corporate Office: 1st Floor,HDFC House, 165 - 166 Backbay Reclamation, H.T. Parekh Marg, Churchgate, Mumbai - 400 020

UIN : IRDAN125P0017V02201112 | IRDAI Reg No. 146 | Customer Service Address: D-301, 3rd Floor, Eastern Business District (Magnet Mall), LBS Marg, Bhandup (West), Mumbai - 400 078

Toll Free Number: 1800 2700 700 | Telephone : +91 22 6638 3600 Fax: 91 22 6638 3699 | Email: care@hdfcergo.com

Annexure 8: Change of Scopes

DBL HASSAN PERIYAPATNA TOLLWAYS LIMITED
(CIN No. : U45203MP2015PLC034878)

DBL/SH-21/HAS-PTA/WCP-3/2019-20/852

16th July 2019

To,
The Chief Engineer,
Karnataka Road Development Corporation Ltd
4th Floor, Opposite Orion Mall,
Raj Kumar Road, Rajaji Nagar,
Bangalore, Karnataka-560 010.

Sub: -Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) on hybrid annuity basis Hassan- Ramanathapura – Periyapatna in the state of Karnataka (WCP-3) – **Details of Outstanding Works** -Reg

Ref: 1. Concession Agreement Dated: 16.12.2015
2. Authority letter No- KRDCL/Co-finance/WCP-3/2019-20/955 dated 26.06.2019

Dear Sir,

The Concessionaire is in receipt of your office letter cited above which the Authority has requested to the Independent Engineer to list out all the items works in a desired format which are not able to be executed for the reason due to unavailability of land or any issue due to site condition.

The Concessionaire likes to affirm here that all the Construction activities within the stretches handed over by the Authority has been completed and some of the activities are being outstanding due to the issues which are purely attributable by the Authority.

In the absence of Team Leader, Concessionaire is herewith submitting proposal of De-scope with the list of the items which shall be dropped from the scope as enclosed in desired format in Annexure-I.

Further considering the above points it is requested to early action on the said issue and settle all the outstanding payments due to the Concessionaire at the earliest.

Thanking you and assuring our best service all the time.

Yours Faithfully,

Retnakeran Sajilal
(Authorized Signatory)
DBL Hassan-Periyapatna Tollways Limited

Encl: Annexure-I.
CC to: 1. The Executive Engineer, KRDCL, Mysore
2. The Independent Engineer, Rougthon-Satra, Arakalgud.

Registered Office : Plot No. 5, Inside Govind Narayan Singh Gate, Chuna Bhatti, Kolar Road, Bhopal - 462016 (M.P.) Ph No 0755-4029999, Fax 0755-4029998, E-mail : db@dilipbuildcon.co.in
Project Office: House No. 34, MIG, Santhemarur Road, Opp. Banne Mantapa, Arkalgud Taluk, Hassan Dist, Karnataka - 573 102, Ph: 08175-221771 Email: dblhassan@dbl.co.in

Annexure-I

Design, Build, Finance, Operate, Maintain and Transfer (DBFOMT) of Existing State Highway Hassan-Piriyapatna in the State of Karnataka on DBFOMT Annuity Basis WCP-3

Authority	Karnataka Road Development Corporation Limited
Independent Engineer	Aarvee-AATNA
Concessionaire	DBL Hassan Periyapatna Tollways Limited

S. No.	Description	Unit	As per contract Scope	Completed	Balance			Remarks
					To be Completed	To be De-Scope		
1	Bus bay	Nos	28	24	2	2		
2	Bus shelter	Nos	28	23	2	3		
3	Drain Side Kerb	Rmt	30334	28794	0	1540		
4	Footpath	Rmt	30334	28794	0	1540		
5	Ground Water Recharge Pit	Nos	10	0	10	0		
6	Silt Traps	Rmt	6096	0	0	6096		
7	Electrical Pole	Nos	456	436	0	20		
8	Sign Boards	Nos	2076	2040	0	36		
9	Structure Protection Work	Nos	178	161	0	17		
	Grand Total							

Concessionaire