SHREM FINANCIAL PRIVATE LIMITED

Development of Tikamgarh (Dhajrai) – Jatara – Palera - Nowgaon Major District Road in the State of Maharastra on BOT (Toll+Annuity) Basis.

TECHNICAL DUE DILIGENCE REPORT

FEBRUARY, 2021

SUBMITTED BY

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Development of Tikamgarh (Dhajrai) – Jatara – Palera - Nowgaon Major District Road in the State of Maharastra on BOT (Toll+Annuity) Basis.

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CHAPTER 1. INTRODUCTION

1.1 General

DBL TIKAMGARH-NOWGAON TOLLWAYS LIMITED (herein after referred to as the "Concessionaire") had augmented the existing road from Y-Junction "Tikamgarh - Malchara" section of SH-10 and Tikamgarh - Nowgaon (NH-76) in the State of Madhya Pradesh, in accordance with the provisions of the Concession Agreement executed with Madhya Pradesh Road Development Corporation Limited (herein after referred to as the "MPRDCL") on 12th November, 2013 on Design, Build, Finance, Operate and Transfer (DBFOT) on Toll plus Annuity Basis.

Project Road starts at Y-Junction at Km.10+800 at Tikamgarh - Malehra road (SH-10) and ends in Km. 107+000 of Jhansi - Nowgaon (NH-76) road. Design length of road is 76.400 Kms.

SHREM ROADWAYS PRIVATE LIMITED acquired DBL TIKAMGARH NOWGAON TOLLWAYS LIMITED vide agreement dated 26.03.2018

SHREM FINANCIAL PRIVATE LIMITED (SFPL) appointed RUKY Projects Pvt. Ltd. as consultants 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 if any and to review the traffic potential and to estimate the projected Toll Collection etc.

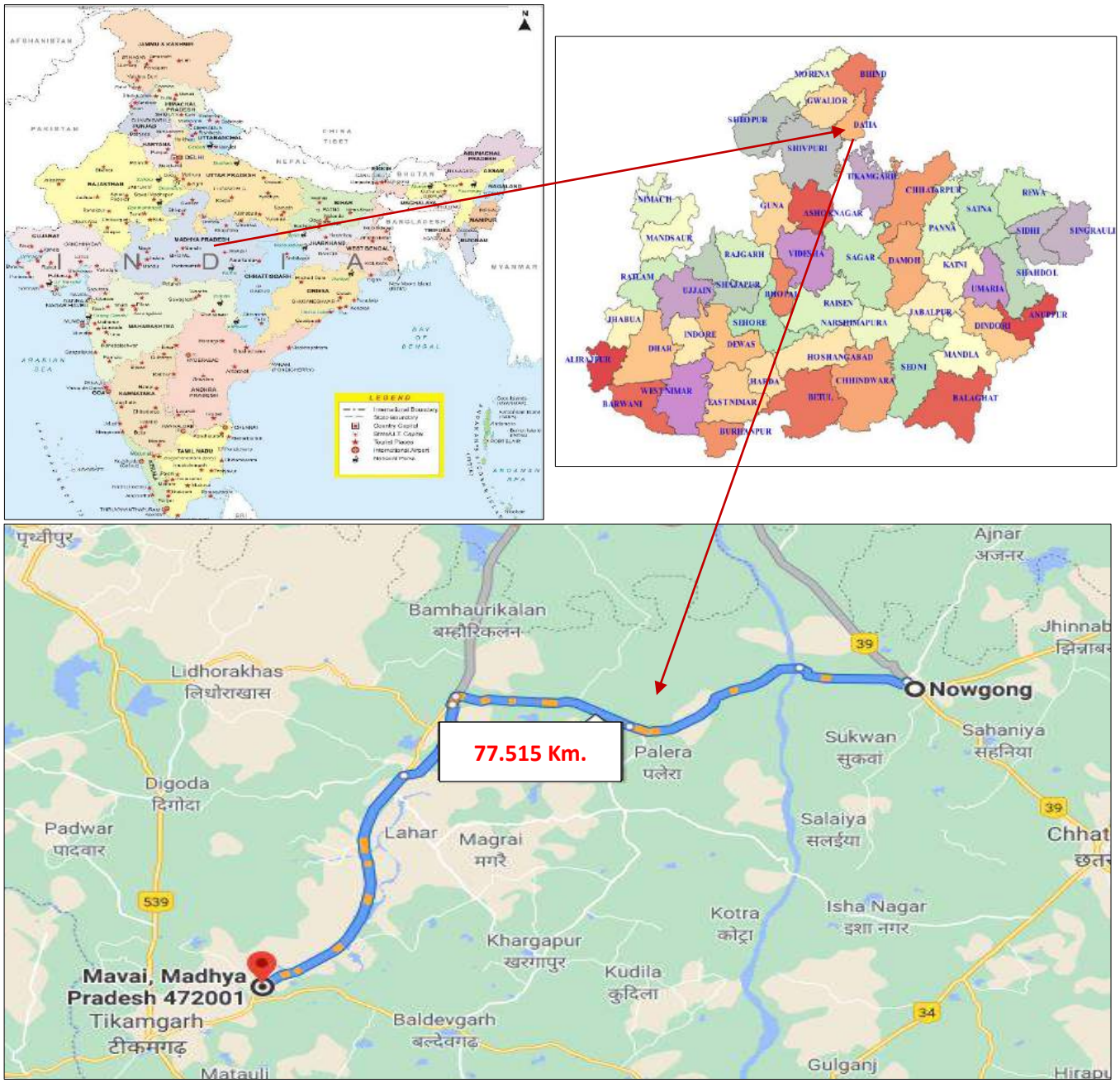

Figure 1.1: Project Location Map

1.2 Project Data:

The details of the Project are listed in the following Table 1.1.

Table 1.1: Project Data.

S. No.	Particulars	Details
1	Name of the project	Development of Tikamgarh (Dhajrai) – Jatara – Palera - Nowgaon MDR from Y-Junction at Tikamgarh to Jhansi Nowgaon on Build, Operate and Transfer (BOT) on Toll + Annuity Basis.
2	Road Type	Major District Road (MDR)
3	Name of the Authority	Madhya Pradesh Road Development Corporation Limited
4	Name of the Concessionaire	DBL Tikamgarh-Nowgaon Tollways Limited
5	Name of the EPC Contractor	Dilip Buildcon Limited
6	Design Length as per Schedule B of CA	76.400 Kms.
7	Date of LOA	27.09.2013
8	Date of Agreement	12.11.2013
9	EPC Cost	116.53 Cr
10	Nature of contract	DBFOT (Toll + Annuity)
11	Toll collected by	MPRDCL
12	Concession Period	15 years from the Appointed date
13	Appointed date	08.08.2014
14	Concession end date	07.08.2029
15	Construction Period	730 days from the Appointed date
16	Schedule Completion Date	06.08.2016
17	Date of issuance of Provisional Certificate (Commercial Operation Date)	26.05.2015
18	Date of issuance of Completion Certificate	13.08.2015
19	Annuity Amount (every six months)	Rs 8.91 Cr
20	Total Number of Annuities payable	26 Nos.
21	First Annuity Payment Date	26.11.2015
22	Total Number of Annuity Paid	11 Nos.

1.3 Scope of Consultancy Services

The scope of work includes providing Technical Due Diligence of the project road 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
- Collection of historic/past toll revenue data
- Collection of historic/past classified Traffic data from toll plaza and to estimate the projected traffic to arrive at revenue projections.
- 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 review of tolling system to evaluate the efficiency and functionality of tolling system and to identify and give suggestions to improve if any setbacks in the system.
- 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. PROJECT DESCRIPTION & TECHNICAL DETAILS

2.1 Salient Features of the Project:

The salient features as per schedule B and Schedule C of Concession Agreement (CA) including Change of scope are given in the following **Table 2.1.**

Table 2.1: Salient Features

S. No.	Particulars	As per Schedule B of CA	COS	As per Site
1	Total Length	76.400 Kms.	1.115 Kms.	77.515 Kms.
2	Length of 2-Lane with Granular shoulder	63.000 Kms.	1.115 Kms.	64.115 Kms.
3	Length of 2-Lane with paved shoulder	10.000 Kms.	---	10.000 Kms.
4	Length of 4-Lane road	3.400 Kms.	---	3.400 Kms.
5	Length of Jatara Bypass	8.400 Kms.	---	8.400 Kms.
6	Toll Plaza	2 Nos.	---	2 Nos.
7	Bus Shelters	8 Nos.	---	8 No
8	Truck Lay Bays	Nil	---	Nil
9	Major Junction	6 Nos.	---	6 Nos.
10	Minor Junctions	14 Nos.	---	14 Nos.
11	Major Bridges	2 Nos.	+1	3 Nos.
12	Minor Bridges	9 Nos.	(+4,-1) Nos.	12 Nos.
13	Box/Slab Culverts	34 Nos.	(+17,-6) Nos.	36* Nos.
14	Pipe Culverts	55 Nos.		60* Nos.

*As per site condition, 9 Slab culverts are not constructed and 5 additional Hume Pipe Culverts are constructed as per requirement.

2.2 Typical Cross Section (TCS) Schedule:

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

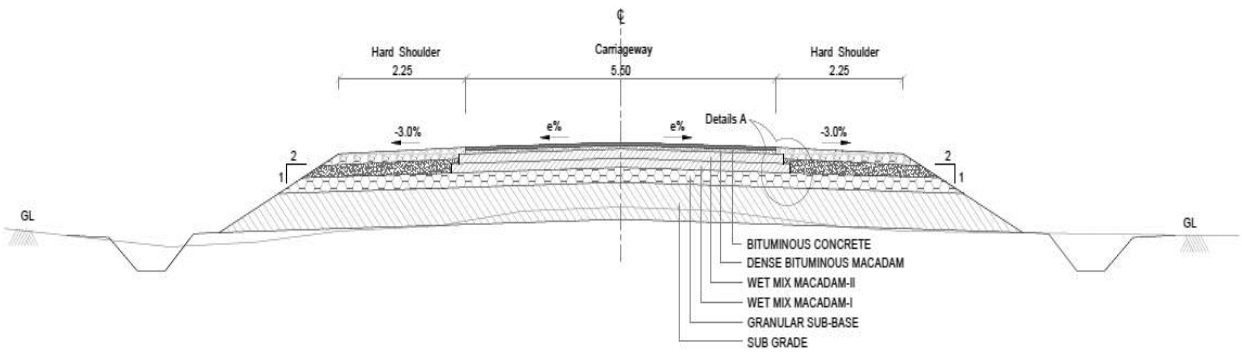

Figure 2.1: (TCS 2.1) Two Lane with Granular Shoulder.
(Cross Section in Open Areas & Rural Areas)

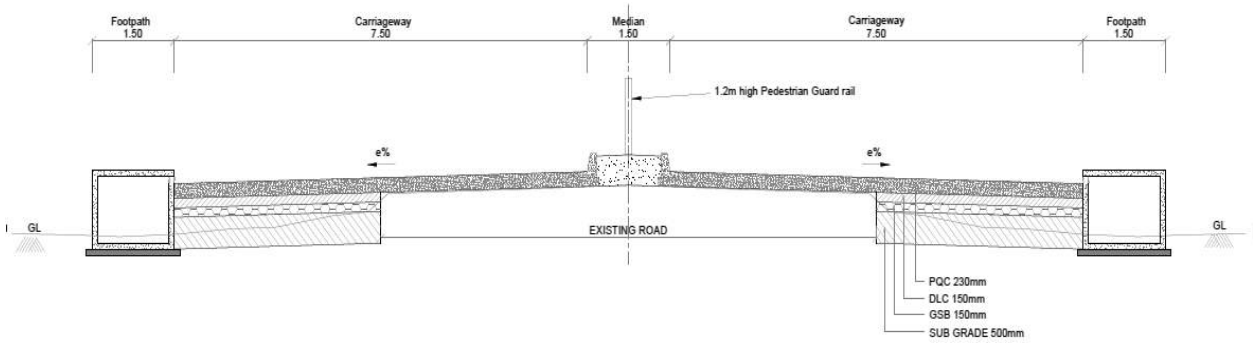

Figure 2.2: (TCS 2.2) Widening to 4 Lane divided Carriageway with footpath Built up area

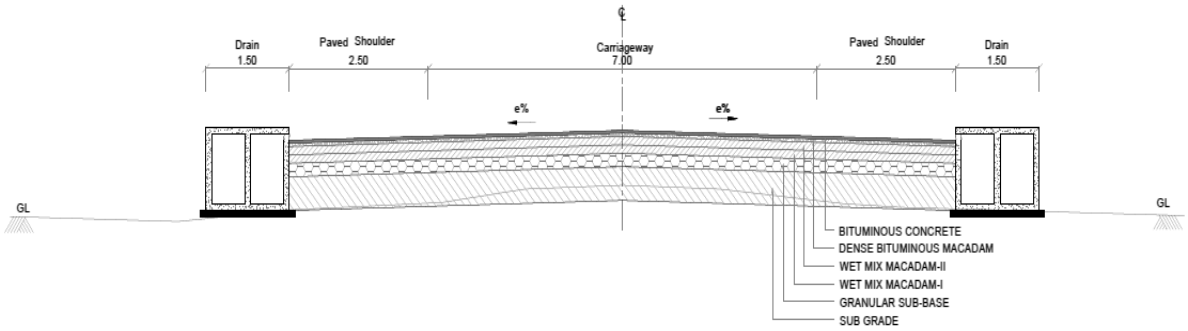

Figure 2.3: (TCS 2.3) Two Lane Carriageway (7.0 m) with Paved shoulder (In Built up Areas)

TCS Schedule is provided below.

Table 2.2: TCS Schedule

S. No.	From Chainage (Km.)	To Chainage (Km.)	Length (Kms.)	Type of TCS
1	0+000	0+400	0.400	TCS.2.3
2	0+400	2+420	2.020	TCS.2.1
3	2+420	5+020	2.600	TCS.2.3
4	5+020	9+700	4.680	TCS.2.1
5	9+700	10+720	1.020	TCS.2.3
6	10+720	17+700	6.980	TCS.2.1
7	17+700	18+700	1.000	TCS.2.3
8	18+700	38+420	19.720	TCS.2.1
9	38+420	40+420	2.000	TCS.2.3
10	40+420	52+500	12.080	TCS.2.1
11	52+500	55+900	3.400	TCS.2.2
12	55+900	63+240	7.340	TCS.2.1
13	63+240	64+240	1.000	TCS.2.3
14	64+240	68+240	4.000	TCS.2.1
15	68+240	69+240	1.000	TCS.2.3
16	69+240	76+560	7.320	TCS.2.1
17	76+560	77+515	0.955	TCS.2.3

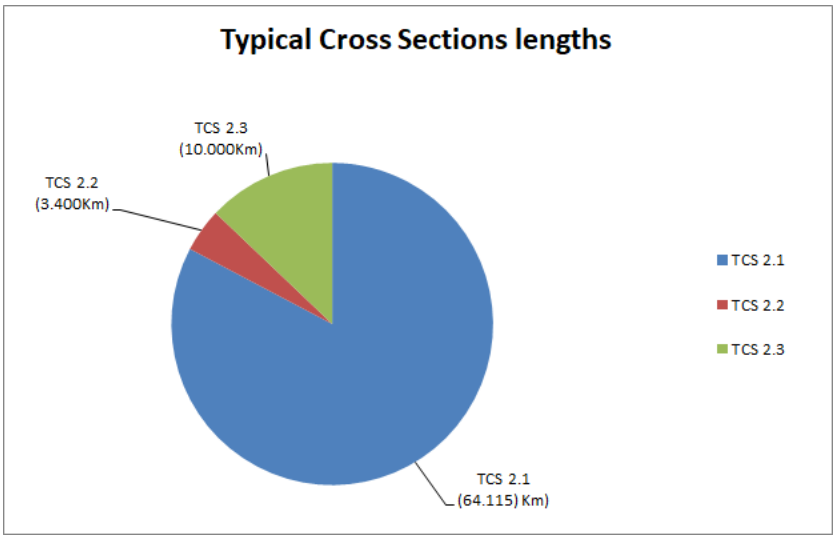

Figure 2.4: Pictorial Diagram of TCS Lengths

2.3 Road Side Drainage

- To facilitate quick disposal of storm water from the carriage way and to avoid accumulation of drainage. Side drains are constructed along the main carriage way on both flanks as specified in Schedule B of the Concession Agreement in strict adherence to the Standard Specifications set forth in Schedule D of the Concession Agreement

- Accordingly, Concessionaire has provided RCC covered drains with footpath in built up areas while earthen drains in open and rural areas.

Service Roads:

Service roads are not provided along the entire stretch of the project road as per provisions of Schedule B of the Concession Agreement.

2.5 Bypass/Realignment:

Bypass constructed from Km. 38+400 to Km. 46+800 of length 8.400 Kms. as per Provisions of Concession agreement Schedule B of Concession Agreement.

Intersections:

As per Schedule B of the Concession Agreement 6 Major Junctions and 14 Minor Junctions are developed. Details are given below.

Table 2.3: Summary of Junctions

S. No.	Chainage (Km.)	Side	Type of Junction	Junction category
1	1+200	RHS	T	Major
2	5+100	LHS	Y	Minor
3	11+200	LHS	Y	Minor
4	11+200	LHS	T	Minor

S. No.	Chainage (Km.)	Side	Type of Junction	Junction category
5	12+200	LHS	T	Minor
6	13+200	LHS	Y	Minor
7	14+400	LHS	T	Minor
8	18+600	LHS	T	Minor
9	20+100	LHS	T	Major
10	20+600	RHS	T	Minor
11	22+200	LHS	T	Minor
12	22+200	RHS	T	Minor
13	28+600	LHS	T	Minor
14	29+400	RHS	Y	Minor
15	32+200	RHS	T	Minor
16	35+600	RHS	T	Major
17	37+100	LHS	T	Major
18	38+400	LHS	T	Minor
19	43+100	LHS	Y	Major
20	47+400	LHS	T	Major

2.7 Grade Separated Structures and underpasses:

Vehicular underpasses are not proposed on the Project road.

2.8 Road Over Bridge(ROB):

ROBs are not proposed in the project road.

2.9 Summary of the Carriageway Details:

Table 2.4: Summary of Carriageway Details

S. No.	Description	Flexible (Kms.)	Rigid (Kms.)	Remarks
1	2 Lane with Granular shoulder	64.14	---	TCS 2.1 of Schedule D of CA
2	2 Lane with Paved shoulder	9.975	---	TCS 2.3 of Schedule D of CA
3	4 Lane	---	3.4	TCS 2.2 of Schedule D of CA
4	Total Length of the Project	74.115	3.4	
5	Total Length of the Project	77.515		
6	TYPE OF ALIGNMENT			
7	New Alignment	---	---	
8	Realignment	---	---	
9	Strengthening	---	---	
10	Reconstruction	74.115	---	
11	Widening	---	3.4	
12	Total Length of the Project	74.115	3.4	
13	Total Length of the Project	77.515		

Summary of Structures and Culverts:

Summary of Structures as per provisions of schedule B of the CA is given below.

Table 2.5: Summary of Structures

S. No.	Description	Major Bridges (Nos.)	Minor Bridges (Nos.)	Pipe Culverts (Nos.)	Box/Slab Culverts (Nos.)
1	Retained	2	3	06	8
2	Reconstruction	0	6	49	26
3	Repair and strengthening	0	0	0	0
4	New	0	0	0	0
	Total	**2**	**9**	**55**	**34**

2.10 Toll Plazas:

As per Schedule C provisions of the Concession Agreement Two Toll Plazas have been constructed at site one at Km. 12+000 and second one at Km. 75+900(Existing Chainage). Salient features of Toll Plazas are provided below.

- Each side of toll plaza comprises of 1 Normal Lane and 1 extra wide lane.
- The lane width in normal lanes is 3.200m and extra lane is 4.500m width.
- The width of islands provided is 1.800m.
- Single canopy is provided to cover the toll lanes.
- Each Toll plaza building is G+1 floor building which houses Control room, UPS, Accounts and Pantry

Km. 12+000

Km. 75+900

Figure 2.5: Representative Photographs of Toll Plazas

2.11 Bus shelters:

As per the provisions of Schedule C of the CA, 8 Nos. Bus shelters are provided. Details such as Chainage Location and Name of Village are listed in the following **Table 2.6**.

Table 2.6: List of Bus shelters

S. No.	Chainage (Km.)	Location
1	1+200	Nowgaon
2	11+100	Dhajrai Village
3	15+400	Mabai Village
4	20+600	Majna village
5	25+100	Palera Village
6	39+100	Jatara village
7	46+100	Dinau Village
8	66+100	Garroli village

2.12 Other Project Facilities Provided as per Schedule C of CA:

- Road side furniture: Sign Boards Kilometer stones, Road Marking and object/hazard markers are provided in accordance with IRC-SP: 73-2007.
- Traffic Safety Devices: Metal Beam Crash barriers, parapet walls are provided as per the provisions of Schedule C of the Concession Agreement.
- 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 being maintained.
- Medical Aid Post: Provided at Toll Plaza locations and in operational
- Highway Lighting: Highway lighting is provided at Toll Plaza and is functional.

Km. 0+000

Km. 20+600

Km. 46+100

Km. 12+000

Figure 2.6: Representative Photographs of Project facilities

CHAPTER 3. ROAD INVENTORY & PAVEMENT CONDITION

3.1 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:

3.2 Road Inventory

Inventory of the project road was carried out physically and is summarized in **Table 3.1 .**

Table 3.1: Road Inventory

S. No.	Features	Remarks
1	Terrain	Plain Rolling and mild hilly
2	Land Use	Built Up 18 %, Agriculture 82%
3	Four lane length	3.400 Kms. (Palera Municipal area)
4	Two Lane length	74.115 Kms.
5	Earthen shoulder	1.0 m to 1.5m Width on site
6	Bypasses	8.400 Kms.
7	Junctions	06 Nos Major Junctions, 14Nos Minor Junctions
8	Toll Plaza	Km. 12+000 and Km. 75+900
9	Sign boards	Sign boards are provided as per highway requirements
10	Road Markings	Lane markings are provided as per highway requirements
11	Bus Bays /shelters	08 nos.
12	Street Lighting	Highway lightings are provided as per highway requirements
13	Avenue plantation	Provided along the Project road

3.3 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 3.2: 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.

Pavement surface condition assessment is a key component of infrastructure asset management. The information is 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.

3.4 Pavement Condition Survey

The survey on general pavement condition was primarily undertaken by means of slow drive - over survey, and supplemented with measurements where ever 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, pot holes, 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 Summary of field measurements of the Pavement Condition survey is tabulated in the standard proforma as per IRC: SP-19 and is given in **ANNEXURE 1.**

Table 3.3: Pavement condition summary

From Chainage (Km.)	To Chainage (Km.)	Length (Kms.)	Condition
0+000	77+515	77.515	Good

Km. 0+000

Km. 12+500

Km. 23+800

Km. 48+200

Km. 62+400

End Point

Figure 3.1: Representative Photographs of Pavement Condition

CHAPTER 4. INVENTORY AND CONDITION OF STRUCTURES

4.1 General Assessment and Details 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 guide lines provided in IRC SP: 52-1999 & IRC SP: 35-1990.

4.2 Inventory of Structures

There are 03 Nos Major Bridges, 12 Nos Minor Bridges, 60 Nos Pipe culverts and 36 Nos Slab/ Box culverts are there along this project road.

Table 4.1: List of Structures

S. No.	Type of Structure	Numbers
1	Major bridges	03 Nos.
2	Minor Bridge	12 Nos.
3	Pipe culverts	60 Nos.
4	Slab/Box Culverts	36 Nos.

For Major bridges, the superstructure is of RCC solid type resting on CRM wall type piers and abutments with open foundation. For minor bridges, the superstructure is of RCC solid slab and the substructures are of CRM/PCC conventional wall type supported on open foundations. 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. The condition of most of the culverts is fair. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3**.

4.3 Details of Major Bridges:

The total length of the major bridge at Km 19+513 is 64.0m with 8 spans. The superstructure consists of RCC solid slab. Both pier and abutment are of conventional CRM wall type structures resting on open foundations. Tar paper bearings are provided. Buried type Expansion joints and Mild steel railings on both sides of the deck.

The total length of the major bridge at Km 48+433 is 143.0m with 11 spans. The superstructure consists of RCC solid slab. Both pier and abutment are of conventional CRM wall type structures resting on open foundations. Tar paper bearings are provided. Buried type Expansion joints and steel railings on both sides of the deck.

The total length of the major bridge at Km 67+764 is 435.0m with 29 spans. The superstructure consists of Arch slab. Both pier and abutment are of conventional CRM wall type structures resting on open foundations. Steel railings on both sides of the deck.

Table 4.2: List of Major Bridges

S. No.	Chainage (Km.)	Span (m.)	Total Length of Bridge (m)
1	19+513	8 x 8.0	70.400
2	48+433	11 x 13.0	143.000
3	67+764	29 x 15.0	435.000

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

Km. 19+513

Km. 19+513

Figure 4.1: Representative photographs of Major Bridges

4.4 Details of Minor Bridges

There are 12 minor bridges in the project stretch. The type of superstructure for some minor bridges is RCC solid slab and the substructure is conventional CRM wall type supported on open foundations. Some are RCC box type bridges. Expansion joints are buried type and bearings are of tar paper and elastomeric bearings. for Solid Slab Super Structure RCC crash barriers are provided on all structures.

Table 4.3: Inventory of Minor Bridges

S. No.	Chainage @ Km.	Span (m)	Total Length of Bridge (m)	Description
1	5+255	3 x 5.0	16.400	The Minor Bridge has RCC Box structure, RCC crash barrier, bituminous wearing coat.
2	21+583	2 x.4.0	8.800	The Minor Bridge has RCC Box structure, RCC crash barrier, bituminous wearing coat.
3	23+951	2 x 4.5	10.300	The Minor Bridge has RCC Box structure, RCC crash barrier, bituminous wearing coat.
4	26+176	1 x 9.6m.	9.600	The Minor Bridge has RCC Box structure, RCC crash barrier, bituminous wearing coat.
5	30+366	3 x 6.0m.	1800	The Minor Bridge has RCC solid slab superstructure supported on CRM wall type piers and abutment. Other features are RCC parapet wall, bituminous wearing coat, and Tar paper Bearings and buried type expansion joints.
6	40+251	2 x 4.0m.	9.100	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
7	41+219	1 x 6.0m.	6.800	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
8	47+755	3 x 7.0m.	21.000	The Minor Bridge has RCC solid slab superstructure supported on CRM wall type piers and abutment. Other features are steel railings, bituminous wearing coat, and Tar paper Bearings and buried type expansion

S. No.	Chainage @ Km.	Span (m)	Total Length of Bridge (m)	Description
				joints.
9	51+666	3 x 6.0m.	19.700	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
10	52+697	2 x 4.0m.	9.400	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
11	63+142	2 x 4.0m.	9.400	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
12	74+378	2 x 4.0m.	9.400	The Minor bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.

Km. 23+951

Km. 40+251

Figure 4.2: Representative photographs of Minor Bridges

4.5 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. Some of the pipe culverts need vent clearance. In general, the condition of all the structures is found satisfactory. The details of the same are given in the following sections. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3.**

4.5.1. Details of the Slab/Box Culverts

There are 36 No's of slab/Box culvert in the project stretch. The details of the culverts are as given below.

Table 4.4: List of Slab/Box Culverts

S. No.	Chainage (Km.)	Span (m.)	Vent Size (m.)
1	2+145	1 x 6.00	3.500
2	8+030	1 x 1.00	2.000
3	14+209	1 x 4.00	4.000
4	14+637	1 x 4.00	4.000
5	15+720	1 x 2.80	2.700
6	15+895	1 x 2.10	2.100
7	17+017	1 x 4.00	4.000
8	19+437	1 x 4.00	4.000

S. No.	Chainage (Km.)	Span (m.)	Vent Size (m.)
9	20+430	1 x 3.00	2.000
10	21+182	1 x 4.00	4.000
11	27+697	1 x 6.00	4.500
12	32+026	1 x 1.00	1.000
13	32+174	1 x 1.60	2.000
14	32+774	1 x 2.00	2.100
15	35+687	1 x 3.80	2.100
16	36+096	1 x 2.00	2.000
17	36+527	1 x 3.00	2.000
18	43+444	1 x 2.50	2.100
19	45+182	1 x 4.70	2.100
20	49+972	1 x 4.00	4.500
21	54+188	1 x 1.50	1.500
22	55+588	1 x 6.00	3.100
23	56+999	1 x 3.00	3.000
24	57+950	1 x 3.00	2.800
25	58+688	1 x 2.00	2.900
26	60+140	1 x 3.00	3.000
27	61+489	1 x 4.00	4.000
28	63+656	1 x 4.00	2.500
29	64+279	1 x 6.00	4.000
30	64+778	1 x 4.00	4.000
31	65+586	1 x 3.80	2.100
32	66+359	1 x 6.00	4.000
33	68+132	1 x 4.00	3.500
34	72+777	1 x 4.00	3.500
35	75+766	1 x 4.00	3.500
36	77+448	1 x 4.00	3.500

The general condition of above slab culverts is good. Few of the culverts need Vent clearance, as some debris/garbage was found in the vent ways. Maintenance is to be carried out to most of the culverts in the form of vent clearance and Stone Pitching for Quadrants. All these activities are to be attended, before onset of monsoon every year under O&M.

Km. 14+209

Km. 14+637

Km. 21+182

Km. 27+697

Figure 4.3: Representative photographs of Slab Culverts

4.5.2. Details of the Pipe Culverts

There are 60 No's of pipe culverts in the project stretch. The details of the culverts are as given below.

Table 4.5: List of Pipe Culverts

S. No.	Chainage (Km.)	No. of Row/Dia.(m)	S. No.	Chainage (Km.)	No. of Row/Dia.(m)
1	0+784	1 x 0.9	31	31+038	2 x 0.9
2	1+297	1 x 1.2	32	32+496	1 x 1.2
3	3+211	2 x 1.2	33	33+533	1 x 1.2
4	3+279	1 x 1.2	34	36+385	1 x 1.0
5	3+444	2 x 0.9	35	36+939	1 x 1.0
6	4+173	1 x 1.2	36	39+175	1 x 1.0
7	4+542	1 x 1.2	37	39+736	1 x 1.2
8	5+610	1 x 1.2	38	39+917	1 x 1.2
9	5+810	1 x 1.2	39	42+339	1 x 1.2
10	6+069	1 x 1.2	40	42+696	1 x 1.2
11	6+937	1 x 0.9	41	43+576	2 x 0.9
12	7+367	1 x 1.2	42	45+484	1 x 1.2
13	9+440	1 x 1.2	43	46+457	1 x 1.2
14	12+107	1 x 1.2	44	47+423	1 x 1.0
15	12+711	2 x 0.9	45	48+686	1 x 1.0
16	13+093	2 x 1.2	46	53+494	1 x 1.0
17	13+757	1 x 1.2	47	53+760	1 x 1.2

S. No.	Chainage (Km.)	No. of Row/Dia.(m)	S. No.	Chainage (Km.)	No. of Row/Dia.(m)
18	14+811	1 x 1.2	48	54+458	1 x 1.2
19	16+366	2 x 1.2	49	55+914	1 x 1.2
20	17+395	1 x 1.2	50	56+068	1 x 1.2
21	19+898	2 x 0.9	51	56+350	1 x 1.0
22	22+261	1 x 1.2	52	58+381	1 x 1.0
23	22+505	1 x 1.2	53	61+768	1 x 1.2
24	23+056	1 x 1.2	54	62+061	1 x 1.2
25	24+042	1 x 1.2	55	62+802	1 x 1.2
26	24+345	1 x 1.2	56	67+356	1 x 1.2
27	25+414	1 x 1.2	57	69+221	1 x 1.2
28	29+305	1 x 1.2	58	69+516	1 x 1.2
29	29+471	1 x 1.2	59	71+754	1 x 1.2
30	30+778	1 x 1.2	60	76+886	1 x 1.2

The general condition of above pipe culverts is good. Few culverts are chocked and need clearance as some debris/garbage was found in the ventways. All these activities are to be attended, before onset of monsoon every year under O&M.

CHAPTER 5. PAVEMENT DESIGN VALIDATION AND OVERLAY SCHEDULES

5.1 General:

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

5.2 Pavement design:

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 see that no permanent deflections result in the Sub Grade, 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 Top 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: 37-2001 publication while the current publication is IRC: 37-2018.

5.3 Review of Pavement Design

The project road has been divided into two homogeneous sections HS-I: Km. 0+000 to Km. 37+000 and HS-II: Km. 37+000 to 76+400. As per the pavement design approved in the project, the following conclusions are given.

Table 5.1: Flexible Pavement Design summary

S. No.	Description/ Pavement layer	HS-I Parameters	HS-II Parameters
1	Sub Grade CBR (%)	10%	10%
2	Design Life (Years)	15 years	15 years
3	Design Traffic* (MSA)	2.44 MSA actual 10MSA Adopted	9.61 MSA actual 10MSA Adopted
4	Surface course (BC)	40 mm	40 mm
5	Binder course (DBM)	-	50 mm
6	Crack relief layer (AIL)	100 mm	100 mm
7	Base course (CTB)	190 mm	200 mm
8	Sub Base course (GSB)	250 mm	200 mm

*Actual traffic arrived at pavement design stage for HS-1 and HS-II is 2.44 MSA and 9.61 MSA respectively which is less than the specified MSA in Schedule D of CA (10MSA). Hence 10 MSA is adopted in pavement design to evaluate the crust thickness.

5.4 Validation of Pavement design

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”.

Pavement design validation as per actual traffic from COD. As per IRC-37, Vehicle Damage Factor (VDF), Distribution of commercial vehicles and growth rate values are 3.5, 0.75 and 5% respectively summary is given below.

Table 5.2: Real time traffic from COD and Project traffic and CMSA (For HS -I)

FY Year	AADT in Vehicles					CVPD (Veh.)	MSA	CMSA	Year	Remarks
	Car	LCV	BUS	2-AT	MAV					
2016	292	46	23	33	22	124	0.12	0.12	1	Actual
2017	336	68	19	53	27	167	0.16	0.28	2	Actual
2018	417	22	30	5	58	115	0.11	0.39	3	Actual
2019	707	60	41	10	60	171	0.16	0.55	4	Actual
2020	619	85	43	17	41	186	0.18	0.73	5	Actual
2021	650	89	45	18	43	195	0.19	0.92	6	Projected
2022	683	94	47	19	45	205	0.20	1.11	7	Projected
2023	717	98	50	20	47	215	0.21	1.32	8	Projected
2024	753	103	52	21	50	226	0.22	1.54	9	Projected
2025	790	108	55	22	52	237	0.23	1.76	10	Projected
2026	830	114	58	23	55	249	0.24	2.00	11	Projected
2027	871	119	60	24	57	261	0.25	2.25	12	Projected
2028	915	125	63	25	60	274	0.26	2.51	13	Projected
2029	960	132	67	27	63	288	0.28	2.79	14	Projected
2030	1008	138	70	28	66	303	0.29	3.08	15	Projected

Table 5.3: Real time traffic from COD and Project traffic and CMSA (For HS-II)

FY Year	AADT in Vehicles					CVPD (Veh.)	MSA	CMSA	Year	Remarks
	Car	LCV	BUS	2-AT	MAV					
2016	182	78	7	7	19	111	0.11	0.11	1	Actual
2017	293	128	8	10	57	203	0.19	0.30	2	Actual
2018	384	132	9	11	103	256	0.25	0.55	3	Actual
2019	429	134	12	10	78	234	0.22	0.77	4	Actual
2020	468	141	14	10	42	206	0.20	0.97	5	Actual
2021	491	148	14	10	44	216	0.21	1.17	6	Projected
2022	516	155	15	11	46	227	0.22	1.39	7	Projected
2023	541	163	16	11	48	238	0.23	1.62	8	Projected
2024	569	171	17	12	51	250	0.24	1.86	9	Projected
2025	597	180	17	12	53	262	0.25	2.11	10	Projected
2026	627	189	18	13	56	276	0.26	2.37	11	Projected
2027	658	198	19	14	59	289	0.28	2.65	12	Projected
2028	691	208	20	14	62	304	0.29	2.94	13	Projected
2029	726	218	21	15	65	319	0.31	3.25	14	Projected
2030	762	229	22	16	68	335	0.32	3.57	15	Projected

Based on the above actual traffic, estimated MSA at 8 years and 15 years are 1.32, 3.08 of TP1 respectively. Similarly estimated MSA at 8 years and 15 years of TP2 are 1.62 ,3.57 respectively. Traffic considered in pavement design(10MSA) is more than estimated traffic based on actual traffic. Hence the pavement design adopted is found in order.

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

Table 5.4: Rigid Pavement Design for Toll Plaza

Description	HS-I Parameters	HS-II Parameters
CBR of sub grade	10 %	10%
Design life in years	30	30
Pavement Quality Concrete (PQC) - mm	230	260
Dry Lean Concrete (DLC) - mm	100	100
Drainage Layer (GSB) - (mm)	150	150
Diameter of Dowel Bar (mm)	32	32
Length of Dowel Bar (mm)	450	450
Spacing of Dowel Bars (mm)	240	230
Diameter of Tie Bar (mm)	10 (Deformed)	10 (Deformed)
Length of Tie Bar (mm)	640	555
Spacing of Tie Bars (mm)	540	475

5.5 Overlay during operation and maintenance:

The pavement has been designed to cater traffic 10 MSA for entire project road (up to 2030), whereas the actual traffic is 5 MSA and 10 MSA for HS-I and HS-II respectively. This implies that pavement will be structurally adequate to cater the future traffic with periodic renewal carried out under the maintenance program.

However, it is recommended to carry out traffic survey, pavement condition and pavement strength evaluation before the end of Stage-I of design life (as per pavement design report) and prior to end of concession period to evaluate the requirement of overlay.

Based on the present available data It is envisaged that existing pavement require overlay (periodic renewal) in the year of 2022 and 2029, strengthening for the concession period. Nevertheless, the pavement shall be maintained to the desired level of performance by carrying out periodical renewals as mentioned in subsequent sections.

5.6 Maintenance/ Overlay schedule:

Periodic Maintance includes Profile corrective course overlaid with the periodic renewal of the wearing course of BC. The detailed maintenance schedule is summarized below.

Routine maintenance - Every year
Periodic Renewal for Flexible Pavement - Proposed in the year 2022 and 2030.
Periodic Maintenance for Rigid Pavement – Re-texturing shall be done once in 10 years from construction.

CHAPTER 6. SAFETY AUDIT OF ROAD

6.1 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 has 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 6.1: REFERRED IRC PUBLICATIONS

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 Audit.

6.2 Road Safety Audit

During the site visit it is observed that all safety items are provided as shown in the following **Table** 6.2.

Table 6.2: Safety Items

S. No.	Item Description		Status	Condition
1	Sign Boards	Chevron signs	Available as per site requirement	Good
		Village sign Board	Available as per site requirement	Good
		Informatory Boards	Available as per site requirement	Good
		Object Hazard Markers at culverts	Available as per site requirement	Good
2	Road Marking	Studs & Lane Marking	Available as per site requirement	Fair
3	W Beam Crash Barriers	At High Embankments	Available as per site requirement	Good

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

Few Observations on the road furniture in safety aspects for the project road are mentioned below:

- At few places' reflectors were missing on the sign boards and few sig boards were also damaged.
- Retro Reflective stickers need to be provided for metal beam crash barriers for night time road users at all locations and damaged metal beam crash barriers requires maintenance regularly
- Speed mitigation measures shall be provided at junction to reduce the speed, and adequate visibility shall be maintained at junctions in part of routine maintenance.
- The object hazard markers are placed only on one side of Head walls/parapet walls of all structures, whereas it is to be installed on both sides at structures.

W Beam MCB at approaches of MJB at Km. 28+200

Road safety at Box Culvert at Km. 24+637

Curve Ahead sign board at Km. 48+000

Pedestrian Markings at Km. 48+200

Figure 6.1: Representative photographs during road safety audit

6.3 Conclusion

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

CHAPTER 7. TOLL PLAZA & HTMS

7.1 General

There are two toll Plazas on the project road at Km. 12+000 (Toll Plaza 1) & Km. 75+900 (Toll Plaza 2). Toll Plaza 1 at Km. 12+000 comprises of 4 lanes. One lane in each direction is for 4-wheelers and the second lane is used as bike lane. Toll Plaza 2 at Km. 75+900 also comprises of lane configuration similar to Toll Plaza 1. The lane width in both the plazas is 3.20m. The width of islands provided is 1.8m. The single canopy is provided to cover the toll lanes.

Both the Toll plazas are provided with G+1 floor building which houses control room, UPS and Pantry.

7.2 Tolling Equipment's

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

Table 7.1: Toll Plaza Assets

S. No.	Name	Qty.
1	Smart Card reader (TMS & HTMS)	2
2	Incidental Capture Camera (TMS & HTMS)	7
3	Barrier Controller PCB	1
4	Receiver PCB (AVC's RXPCB)	6
5	Manual Booth Controller	2
6	USB Extension Cable	16
7	RFID ETC Transceiver with accessories	4
8	Electronics Enclosure (TMS & HTMS)	4
9	Lane laser based AVC Profiler (TMS)	2
10	Lane AVC Controller	4
11	Operator monitor 18.8" (TMS & HTMS)	2
12	Manual Booth controller (TMS & HTMS)	4
13	PTZ CAMERA (TMS & HTMS)	1
14	IMAGE CAPTURE CAMERA	2
15	MLS MAGNETIC LOOP SENSOR	8
16	INTERCOM SLAVE UNIT (TMS & HTMS)	4
17	USER FARE DISPLAY (TMS & HTMS)	4
18	CUSTOMIZED KEYBOARD (TMS & HTMS)	4
19	HYBRID LANE SOFTWARE	4
20	CABLING/NETWORKING FOR LANE (TMS & HTMS)	4
21	HANDHELD RFID READER (TMS & HTMS)	2
22	PLAZA SERVER FOR ETC - TMS & HTMS	1
23	INTERCOM MASTER UNIT 10 CHANNEL	1
24	PLAZA SOFTWARE (TMS & HTMS)	1
25	LANE EXIT BARRIER WITH LOOPS & DETECTOR	2

7.3 Vehicles

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

Table 7.2: List of Vehicles

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

Toll Plaza and Building at Km. 12+000

Toll Plaza at Km. 75+900

Figure 7.1: Representative Photographs of Toll Plaza

CHAPTER 8. TRAFFIC CENSUS AND TOLL REVENUE

8.1 Traffic Census

In accordance with clause 22.1, the Concessionaire shall install, maintain and operate electronic/computerized traffic counters at each of the Toll Plazas and collect data relating to the number and types of vehicles using the Project Highway. A weekly statement of such data shall be complied and furnished forthwith by the Concessionaire to MPRDC substantially in the form specified in Schedule N of CA.

Accordingly, the Concessionaire provided toll plaza wise details. Based on the data made available the summarized annual classified Traffic census details for the past five years are provided in **Table 8.1** below. The Actual traffic data recorded below has been taken as a basis to calculate AACGR % (Average Annual Compound Growth Rate).

Table 8.1: Year wise Traffic (Vehicles) Details

(A) Mawai toll plaza

FY Year	Car	LCV	Bus	Truck	MAV	Total Traffic
Apr 2015-Mar 2016	90452	14331	7193	10111	6769	128856
Apr 2016-Mar 2017	122807	24981	6880	19202	9734	183604
Apr 2017-Mar 2018	152135	8051	11128	1659	21161	194134
Apr 2018-Mar 2019	257990	21896	15049	3624	21791	320350
Apr 2019-Mar 2020	226594	31063	15728	6268	14918	294571
AACGR* (%)						**26.30%**

(B) Bela toll plaza

FY Year	Car	LCV	Bus	Truck	MAV	Total Traffic
Apr 2015-Mar 2016	56399	24322	2049	2101	5843	90714
Apr 2016-Mar 2017	107040	46721	2796	3664	20917	181138
Apr 2017-Mar 2018	140166	48287	3175	4174	37716	233518
Apr 2018-Mar 2019	156628	48822	4435	3692	28604	242181
Apr 2019-Mar 2020	171191	51489	5005	3525	15247	246457
AACGR* (%)						**33.52%**

*AACGR- Annual Average Compound Growth Rate

8.2 Actual Revenue Collection

In accordance with clause 19.5, "During the operation period, the Concessionaire shall furnish to MRPDC within 7 days of completion of each month, a statement of fee substantially in the form set forth in Schedule-M (Monthly fee statement)". As per provisions of CA the concessionaire submitted monthly fee statement and the summary of form submitted under Schedule M during the financial year 2019-20 is given under as **Table 8.2**.

Table 8.2: Summary of 2019-20 Tollable traffic and revenue collected at Toll Plaza

(A) Mawai toll plaza

Description	Car	Car(pass)	LCV	Bus	Truck	MAV	Total
In Nos.	100471	1997	27055	14683	4763	12727	161696
Toll Revenue collection in Rs.	4521195	159755	2924455	3310400	1290945	6864275	19071025

(B) Bela toll plaza

Description	Car	Car(pass)	LCV	Bus	Truck	MAV	Total
In Nos.	108940	2213	44976	3975	3169	14152	177425
Toll Revenue collection in Rs.	4902300	177035	4850760	897820	858595	7640225	19326735

The Table 8.1 represent Real time traffic data inclusive of exempted /non tollable traffic on project road for the past five years and the growth rate is calculated to be 26.30% and 33.52% in TP-1 and TP-2 respectively.

The figures shown in Table 8.2 are actual tollable traffic based on which the toll revenue collected and is excluding of exempted/non tollable traffic. For the realistic estimate of the traffic growth and projected revenue calculation actual traffic based on which FY 2019-20 revenue collected (Table 8.2) is considered as a base year traffic and the projected traffic growth rate is restricted to 5% even though the growth as per Table 8.1 is >5%.

Based on the base year traffic and growth rate as explained above traffic projections from year 2019-20 to till end of Concession period toll plaza wise are calculated and summarized below in Table 8.3.

Table 8.3: Projected traffic

(A) Mawai toll plaza

FY Year	AADT in Vehicles					CVPD* (Veh.)	AADT in PCU					CVPD* (PCU)	Remarks
	Car	LCV	BUS	2-AT	MAV		Car	LCV	BUS	2-AT	MAV		
PCU Factor							1	1.5	3	3	4.5		
2020	281	74	40	13	35	162	281	111	121	39	157	428	Actual
2021	295	78	42	14	37	170	295	117	127	41	165	449	Projected
2022	310	82	44	14	38	179	310	123	133	43	173	472	Projected
2023	325	86	47	15	40	188	325	129	140	45	182	495	Projected
2024	341	90	49	16	42	197	341	135	147	48	191	520	Projected
2025	358	95	51	17	45	207	358	142	154	50	200	546	Projected
2026	376	99	54	17	47	217	376	149	162	52	210	573	Projected
2027	395	104	57	18	49	228	395	156	170	55	221	602	Projected
2028	415	110	59	19	52	240	415	164	178	58	232	632	Projected
2029	436	115	62	20	54	252	436	172	187	61	243	664	Projected
2030	457	121	66	21	57	264	457	181	197	64	256	697	Projected

(B) Bela toll plaza

FY Year	AADT in Vehicles					CVPD* (Veh.)	AADT in PCU					CVPD* (PCU)	Remarks
	Car	LCV	BUS	2-AT	MAV		Car	LCV	BUS	2-AT	MAV		
PCU Factor							1	1.5	3	3	4.5		
2020	305	123	11	9	39	182	305	185	33	26	174	418	Actual
2021	320	129	11	9	41	191	320	194	34	27	183	439	Projected
2022	336	136	12	10	43	200	336	204	36	29	192	461	Projected
2023	353	143	13	10	45	210	353	214	38	30	202	484	Projected
2024	370	150	13	11	47	221	370	225	40	32	212	508	Projected
2025	389	157	14	11	49	232	389	236	42	33	223	534	Projected
2026	408	165	15	12	52	243	408	248	44	35	234	560	Projected
2027	429	173	15	12	55	255	429	260	46	37	246	588	Projected
2028	450	182	16	13	57	268	450	273	48	38	258	618	Projected
2029	472	191	17	13	60	282	472	287	51	40	271	648	Projected
2030	496	201	18	14	63	296	496	301	53	42	284	681	Projected

*CVPD: Commercial vehicle per day (LCV+BUS+2 AT+MAV)

8.3 Toll Revenue Calculations

The toll revenue for horizon year is calculated based on the input from the above data, actual toll rates collected on base year (2019-20), with Traffic growth, WPI growth and toll efficiency has been assumed 5%, 4% and 100% respectively and other inputs considered in revenue calculations is given in **Table 8.4**.

Table 8.4: Toll Revenue inputs

Particular	Toll plaza 1	Toll plaza 2
Location	Km. 12+000	Km. 75+900
4 lane length in Kms.	0	0
2 lane length in Kms.	76.400	76.400
Agreement Date	12-11-2013	12-11-2013
Appointed Date	08-08-2014	08-08-2014
Concession period	15	15
Commercial operation date	13-Aug-15	13-Aug-15
Concession End Date	07-Aug-29	07-Aug-29
Traffic study year	2020	2020
Vehicle Type	**AADT**	**AADT**
Car/Jeep/Van	281	305
2-axle Bus	74	123
LCV/LGV	40	11
2A-Truck	13	9
MAV (2A-6A)	35	39
Growth Rate (%)	5%	5%

The split trip type based on the available toll data from Concessionaire is used to derive the annual toll collection for each plaza. The revenue estimated and presented below. Detailed toll revenue estimation is given in **ANNEXURE 4.**

Table 8.5: Toll Revenue Estimated (in Rs. lakhs)

Financial Year	Annual Revenue of TP1 Km. 12+000	Annual Revenue of TP2 Km. 75+900	Total	Remarks
2019-20	190.710	193.267	383.978	Actual
2020-21	205.272	209.819	415.091	Projected
2021-22	228.466	233.470	461.936	Projected
2022-23	246.757	251.737	498.494	Projected
2023-24	265.413	271.682	537.095	Projected
2024-25	292.539	297.630	590.169	Projected
2025-26	315.965	320.411	636.376	Projected
2026-27	347.039	352.235	699.274	Projected
2027-28	371.509	379.304	750.814	Projected
2028-29	399.132	407.414	806.546	Projected
2029-30	154.366	157.747	312.113	129 Days

Note: There are two toll plazas existing on the project road. One booth of the toll plaza in each direction is used for Toll Ticket issue & Checking as well.

CHAPTER 9. OPERATION AND MAINTENANCE

9.1 General

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

9.2 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 beginning of each accounting year during the operation period.

9.3 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 Functioning of the Toll System including charging and collecting the fees from the road user in accordance with the CA.
3 carrying out preventive and periodic maintenance of the Project road;
4 undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;
5 undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment;
6 Functioning of the lighting system;

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

9.4 Operation of Toll Plaza:

One lane in each direction is operating at toll plaza and the extra wide lane is opened only for wide vehicles. The tolling is manned by two people per direction per shift with a day having two shifts. Toll Manager takes care of the daily operation and carries out the task of patrolling on bike. 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.

9.5 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.
Road maintenance can be carried out in four ways as listed below.

i. Preventive Maintenance
ii. Routine Maintenance
iii. Periodic Maintenance
iv. 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. Preventive Maintenance shall include the activities related to each element and the system as a whole of the Project Preventive Maintenance for Structures is estimated by the consultant. The condition data collected from site was used to arrive at the appropriate treatments and quantities. Rates from Schedule of Rates (SOR) of MP, was used to arrive at the cost.

The flexible pavement is in good condition and hence doesn't 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 9.1: Schedule and status of Periodic Maintenance

Description	Schedule	Status
1st Periodic Maintenance	2022	Planned to Execute
2nd Periodic Maintenance	2030	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.

9.6 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 Nov 2020. As per Schedule K of CA, If the roughness value stretch exceeds in a 3000mm in a KM the surface is the stretch shall be rectified. No stretch exceeded the permissible limit in the Project Road.

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 Nov 2020. The test report has been verified and found within permissible limits as per IRC 81.

9.7 O&M Forecast

The O&M costs were estimated based on various parameters of CA and project corridor. The cost summary is given below, and detailed cost estimations are given in **ANNEXURE 5.**

Table 9.2: Proposed Plan for Future Operation & Maintenance Cost (In Crores)

Year	Routine maintenance	Incidental maintenance	Periodic / Major maintenance	Operational Expenses	Total cost per year
2020	0.428	0.204		0.84	1.47
2021	0.441	0.211		0.86	1.52
2022	0.454	0.217	12.15	0.89	13.71
2023	0.468	0.223		0.92	1.61
2024	0.482	0.230		0.95	1.66
2025	0.496	0.237		0.97	1.71
2026	0.511	0.244		1.00	1.76
2027	0.526	0.251		1.03	1.81
2028	0.542	0.259		1.06	1.86
2029	0.558	0.267		0.39	15.30
2030	0.203	0.0097	14.57	0.40	15.27
Total	**5.11**	**2.17**	**26.72**	**9.31**	**57.68**

CHAPTER 10. REVIEW OF CONCESSION AGREEMENT

10.1 General: Scope of Work (Article 2)

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

- construction of the Project road on the Site set forth in Schedule-A of CA and as specified in Schedule-B of CA together with provision of Project Facilities as specified in Schedule-C of CA, and in conformity with the Specifications and Standards set forth in Schedule-D of CA;
- operation and maintenance of the Project road 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.**

10.2 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 6**.

10.3 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 E of CA
- 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

10.4 Major Obligations of the Concessionaire (Clause 5.1)

- The Concessionaire shall obtain necessary permits in conformity with the applicable laws
- Procure appropriate rights for obtaining materials
- Perform and fulfil its obligations under financing Agreements
- To make reasonable efforts to facilitate the acquisition of land required for execution
- Transfer the Project road upon termination of the Contract Agreement

10.5 Obligations relating to the Competing Roads (Clause 6.3):

Neither Authority nor any Governmental Instrumentality shall construct the Competing Road before 10th Anniversary of the Appointed Date.

Performance Security (Article 9)

- The Concessionaire shall submit the Performance security to the Authority within 180 days from the date of the Agreement,
- The Performance security shall remain in force and effect for a period of one year from the Appointed Date
- Performance Security shall be released upon the Concessionaire expending on Project Construction, an Aggregate sum, not less than 20% of the Total Project Cost.

10.7 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 successful completion, the Independent engineer shall issue the Completion Certificate in the form set forth in Schedule J of the Concession Agreement. Copy of the Provisional Completion Certificate issued is enclosed at **Annexure 7**

10.8 Completion Certificate (Clause 14.4)

- Upon completion of Punch list items appended to the Provisional Completion Certificate within 90 days of issuance of Provisional Completion Certificate, Completion Certificate shall be issued to the Concessionaire.
- Copy of the Completion Certificate issued is enclosed at **Annexure 8**.

10.9 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.

10.10 Change of scope (Article 16)

Change of scope proposals were initiated during construction period and consented by the MPRDC and the same are given in **ANNEXURE 10.**

10.11 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, repairs and refurbishments of tolling system and other equipment
- Preventing any unauthorized use of the Project road.
- Protection of environment and provision of equipment and materials

- Complying with safety Requirements in accordance with the provisions of the Contract Agreement.

10.12 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**").

10.13 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.

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.

10.15 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 this 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 point one per cent) of the cost of such repair or rectification as estimated by the Independent Engineer.

10.16 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.

10.17 Monthly Fee Statement (Clause 19.5)

During the Operations Period, the Contractor shall furnish to the Concessionaire and the Authority, if required by the Contractor, within 7 (seven) days of completion of each month, a statement of Fee substantially in the format set out in the Concession Agreement ("Monthly Fee Statement").

10.18 Annuity (Clause 25.1.1)

The Authority agrees and undertakes to pay the Concessionaire for each annuity Payment period on each annuity payment date as set forth in schedule Y of CA, the sum of Rs 8.91 Crores.

As per Clause 25.2.1, In case the COD is different from the Schedule Y of CA, then the annuity payment schedule shall be suitably modified to be a period of 6 months from the preceding Annuity Payment date. The Status of Annuity Payments is Listed below.

Table 10.1: Status of Annuity Payments

S. No.	Particulars	Paid on
1	1st Annuity	8-Dec-15
2	2nd Annuity	1-Jun-16
3	3rd Annuity	2-Dec-16
4	4th Annuity	31-May-17
5	5th Annuity	11-Dec-17
6	6th Annuity	4-Jun-18
7	7th Annuity	4-Dec-18
8	8th Annuity	31-May-19
9	9th Annuity	4-Dec-19
10	10th Annuity	2-Jun-20
11	11th Annuity	27-Nov-20

All the annuities are being paid regularly by the Authority.

10.19 Concession Fee (Article 26)

- In consideration of the grant of Concession the Concessionaire shall pay Concession Fee of Rs1.00 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

10.20 Toll fee Clause (27.1.1)

Toll Fees Shall be revised annually in accordance with Clause 27.2.1.

10.21 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 11. INSURANCE

11.1 Details of Insurance

As per clause 32.1 of the Concession Agreement (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.

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

Table 11.1: Insurance Details

Name of the Policy	Insurance Company	Policy No	Effective Period		Description of the Property
			From	To	
Civil Engineering Completed Risk	National Insurance Company Ltd	321300441910001992	27.03.2020	26.03.2021	Road & Structure: Toll Building & Toll Booths, TMS, HTMS, Office &IT equipment, Electronic Equipment, Road Furniture, Fixtures, electrical Poles Lighting & Fittings, Sign boards & Safety Barrier
Employees Compensation Insurance Policy	HDFC ERGO General Insurance Company Ltd	3114203387673800000	19.05.2020	18.05.2021	All categories of Employees of the Contractor & sub-contractor engaged in the Project
Electronic Equipment Insurance Policy Schedule	Oriental Insurance Company Ltd	171200/44/2021/47	08.09.2020	07.09.2021	EEI Equipment installed in the Project Highway

Copy of the effective insurances are enclosed at **Annexure 9.**

CHAPTER 12. CONCLUSION

12.1 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.

12.2 Pavement Condition

- Pavement condition is good.
- Drainage system is effective along the project road as the RCC drains constructed in built up locations and earthen drains in rural locations.
- Shoulder condition is fair.

12.3 Condition of Structures

- General condition of Bridges is good.
- No major structural defects were noticed
  Condition of Culverts is good.
- Observed vegetation growth in vents of Box and Hume Pipe culverts and they are getting cleared during regular maintenance period.

12.4 Traffic Growth

Based on real time, traffic data was extracted.
The traffic growth observed is 26.30% and 33.52% in TP-1 and TP-2 respectively, where as 5% growth is considered while evaluating forecast of traffic volumes.

12.5 Project Facilities

- Two Toll Plaza are constructed one at Km.12+000 & the other at Km.75+900. Both operational condition.
- Toll Plazas are operated by ETC Toll collection system and connected by network system monitored in administrative building.
- Bus shelters are in good condition.
- Medical Aid post is functional
- Avenue plantation and landscaping is provided at Toll Plaza and being maintained.
- Highway lighting is provided at toll plaza and functional.

12.6 Road safety

- Pavement marking is in good condition and number of sign boards are provided as per Highway requirement. The condition of sign boards is good.
- Other road appurtenances like metal beam crash barriers and Kerb are intact

12.7 Maintenance

- The routine maintenance being carried out by O&M contractor effectively, based on documents reviewed, time to time observations made by client/Authority, being complied and no outstanding NCR's are to be attended as on date.
- Major maintenance (MM) /Periodic maintenance 7 years after COD is to be carried out to be in 2022 as a good industry practice.

12.8 Epilogue

The project is designed and constructed as per the stipulated specifications besides maintenance work is 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 (%)	Ravelling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/		Type (LD/ULD/CD/NO)	Condition (PF/F)***	
0+000	1+000	1	2						F		E/P	F	F	LD	PF	
1+000	2+000								G		E	F	F	ULD	PF	
2+000	3+000								G		E	F	F	ULD	PF	
3+000	4+000								G		E/P	F	F	LD	PF	
4+000	5+000								G		E/P	F	F	LD	PF	
5+000	6+000								G		E/P	F	F	LD	PF	
6+000	7+000	2	2						F		E	F	F	ULD	PF	
7+000	8+000								G		E	F	F	ULD	PF	
8+000	9+000								G		E	F	F	ULD	PF	
9+000	10+000								G		E	F	F	ULD	PF	
10+000	11+000								G		E	F	F	ULD	PF	
11+000	12+000								G		E/P	F	F	LD	PF	
12+000	13+000								G		E	F	F	ULD	PF	
13+000	14+000								G		E	F	F	ULD	PF	
14+000	15+000								G		E	F	F	ULD	PF	
15+000	16+000								G		E	F	F	ULD	PF	
16+000	17+000								G		E	F	F	ULD	PF	
17+000	18+000								G		E	F	F	ULD	PF	
18+000	19+000								G		E/P	F	F	LD	PF	
19+000	20+000								G		E	F	F	ULD	PF	
20+000	21+000								G		E	F	F	ULD	PF	
21+000	22+000								G		E	F	F	ULD	PF	
22+000	23+000								G		E	F	F	ULD	PF	
23+000	24+000								G		E	F	F	ULD	PF	
24+000	25+000								G		E	F	F	ULD	PF	
25+000	26+000								G		E	F	F	ULD	PF	
26+000	27+000								G		E	F	F	ULD	PF	
27+000	28+000								G		E/P	F	F	LD	PF	
28+000	29+000								G		E	F	F	ULD	PF	
29+000	30+000	2	4						F		E	F	F	ULD	PF	
30+000	31+000								G		E/P	F	F	LD	PF	
31+000	32+000								G		E/P	F	F	LD	PF	
32+000	33+000								G		E	F	F	ULD	PF	
33+000	34+000								G		E	F	F	ULD	PF	
34+000	35+000								G		E	F	F	ULD	PF	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Ravelling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/		Type (LD/ULD/CD/N O)	Condition (PF/F)***	
35+000	36+000								G		E	F	F	ULD	PF	
36+000	37+000								G		E	F	F	ULD	PF	
37+000	38+000								G		E	F	F	ULD	PF	
38+000	39+000								G		E	F	F	ULD	PF	
39+000	40+000								G		E	F	F	ULD	PF	
40+000	41+000								G		E	F	F	ULD	PF	
41+000	42+000								G		E	F	F	ULD	PF	
42+000	43+000								G		E	F	F	ULD	PF	
43+000	44+000								G		E	F	F	ULD	PF	
44+000	45+000								G		E	F	F	ULD	PF	
45+000	46+000								G		E	F	F	ULD	PF	
46+000	47+000								G		E	F	F	ULD	PF	
47+000	48+000								G		E	F	F	ULD	PF	
48+000	49+000								G		E	F	F	ULD	PF	
49+000	50+000	3	5						F		E	F	F	ULD	PF	
50+000	51+000								G		E	F	F	ULD	PF	
51+000	52+000								G		E	F	F	ULD	PF	
52+000	53+000								G		E	F	F	ULD	PF	
53+000	54+000								G		E	F	F	ULD	PF	
54+000	55+000								G		E	F	F	ULD	PF	
55+000	56+000								G		E	F	F	ULD	PF	
56+000	57+000								G		E	F	F	ULD	PF	
57+000	58+000								G		E	F	F	ULD	PF	
58+000	59+000								G		E	F	F	ULD	PF	
59+000	60+000								G		E	F	F	ULD	PF	
60+000	61+000								G		E	F	F	ULD	PF	
61+000	62+000								G		E	F	F	ULD	PF	
62+000	63+000								G		E	F	F	ULD	PF	
63+000	64+000								G		E/P	F	F	LD	PF	
64+000	65+000								G		E	F	F	ULD	PF	
65+000	66+000								G		E	F	F	ULD	PF	
66+000	67+000								G		E	F	F	ULD	PF	
67+000	68+000								G		E/P	F	F	LD	PF	
68+000	69+000								G		E	F	F	ULD	PF	
69+000	70+000	2	5						F		E	F	F	ULD	PF	
70+000	71+000								G		E	F	F	ULD	PF	
71+000	72+000								G		E	F	F	ULD	PF	
72+000	73+000	3	5						F		E	F	F	ULD	PF	

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Ravelling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/		Type (LD/ULD/CD/NO)	Condition (PF/F)***	
73+000	74+000								G		E	F	F	ULD	PF	
74+000	75+000	1	4						F		E	F	F	ULD	PF	
75+000	76+000								G		E	F	F	ULD	PF	
76+000	77+000	3	5						F		E/P	F	F	LD	PF	
77+000	77+515								G		E	F	F	ULD	PF	

Annexure 2: Condition of Bridges

S. No.	Chainage (Km.)	Type of Structure	Sub structure	Super structure	Expansion Joint	Approach slabs	Drainage spouts	Wearing coat	Bearings	Quadrant Pitching	Toe wall
1	Km. 5+255	Minor Bridge	Fair	Good	-	Good	Fair	Good	Good	Fair	Good
2	Km. 19+513	Major Bridge	Fair	Good	Good	Good	Fair	Good	Good	Fair	Good
3	Km. 21+383	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good
4	Km. 23+951	Minor Bridge	Fair	Good	-	Fair	Fair	Good	Good	Fair	Good
5	Km. 26+176	Minor Bridge	Fair	Good	-	Good	Fair	Good	Good	Fair	Good
6	Km. 30+366	Minor Bridge	Fair	Good	Fair	Good	Fair	Good	Good	Fair	Good
7	Km. 40+251	Minor Bridge	Fair	Good	-	Good	Fair	Good	Good	Fair	Good
8	Km. 41+219	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good
9	Km. 47+755	Minor Bridge	Fair	Fair	Fair	Good	Fair	Good	Good	Fair	Good
10	Km. 48+433	Major Bridge	Fair	Fair	Fair	Good	Fair	Good	Good	Fair	Good
11	Km. 51+666	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good
12	Km. 52+697	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good
13	Km. 63+142	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good
14	Km. 67+764	Major Bridge	Fair	Fair	Fair	Good	Fair	Good	Good	Fair	Good
15	Km. 74+378	Minor Bridge	Fair	Fair	-	Good	Fair	Good	Good	Fair	Good

Annexure 3: Condition of Culverts

Box/ Slab Culverts

S. No.	Chainage (Km.)	Box/slab	Return wall	Quadrant pitching	Toe wall	Aprons	Remarks
1	2+145	Good	Good	Fair	Fair	Fair	
2	8+030	Good	Good	Fair	Fair	Fair	
3	14+209	Good	Good	Fair	Fair	Fair	
4	14+637	Good	Good	Fair	Fair	Fair	
5	15+720	Good	Good	Fair	Fair	Fair	
6	15+895	Good	Good	Fair	Fair	Fair	
7	17+017	Good	Good	Fair	Fair	Fair	
8	19+437	Good	Good	Fair	Fair	Fair	
9	20+430	Good	Good	Fair	Fair	Fair	
10	21+182	Good	Good	Fair	Fair	Fair	
11	27+697	Good	Good	Fair	Fair	Fair	
12	32+026	Good	Good	Fair	Fair	Fair	
13	32+174	Good	Good	Fair	Fair	Fair	
14	32+774	Good	Good	Fair	Fair	Fair	
15	35+687	Good	Good	Fair	Fair	Fair	
16	36+096	Good	Good	Fair	Fair	Fair	
17	36+527	Good	Good	Fair	Fair	Fair	
18	43+444	Good	Good	Fair	Fair	Fair	
19	45+182	Good	Good	Fair	Fair	Fair	
20	49+972	Good	Good	Fair	Fair	Fair	
21	54+188	Good	Good	Fair	Fair	Fair	
22	55+588	Good	Good	Fair	Fair	Fair	
23	56+999	Good	Good	Fair	Fair	Fair	
24	57+950	Good	Good	Fair	Fair	Fair	
25	58+688	Good	Good	Fair	Fair	Fair	
26	60+140	Good	Good	Fair	Fair	Fair	
27	61+489	Good	Good	Fair	Fair	Fair	
28	63+656	Good	Good	Fair	Fair	Fair	
29	64+279	Good	Good	Fair	Fair	Fair	
30	64+778	Good	Good	Fair	Fair	Fair	
31	65+586	Good	Good	Fair	Fair	Fair	
32	66+359	Good	Good	Fair	Fair	Fair	
33	68+132	Good	Good	Fair	Fair	Fair	

S. No.	Chainage (Km.)	Box/slab	Return wall	Quadrant pitching	Toe wall	Aprons	Remarks
34	72+777	Good	Good	Fair	Fair	Fair	
35	75+766	Good	Good	Fair	Fair	Fair	
36	77+448	Good	Good	Fair	Fair	Fair	

Hume Pipe Culverts

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
1	0+784	Good	Good	Fair	-
2	1+297	Good	Good	Fair	-
3	3+211	Good	Fair	Fair	-
4	3+279	Good	Good	Fair	-
5	3+444	Good	Fair	Fair	-
6	4+173	Good	Good	Fair	-
7	4+542	Good	Fair	Fair	-
8	5+610	Good	Fair	Fair	-
9	5+810	Good	Good	Fair	-
10	6+069	Good	Good	Fair	-
11	6+937	Good	Fair	Fair	-
12	7+367	Good	Fair	Fair	-
13	9+440	Good	Fair	Fair	Fair
14	12+107	Good	Good	Fair	Fair
15	12+711	Good	Good	Fair	Fair
16	13+093	Good	Good	Fair	Fair
17	13+757	Good	Fair	Fair	Fair
18	14+811	Good	Good	Fair	Fair
19	16+366	Good	Good	Fair	Fair
20	17+395	Good	Fair	Fair	Fair
21	19+898	Good	Fair	Fair	Fair
22	22+261	Good	Good	Fair	Fair
23	22+505	Good	Fair	Fair	Fair
24	23+056	Good	Fair	Fair	Fair
25	24+042	Good	Good	Fair	Fair
26	24+345	Good	Good	Fair	Fair
27	25+414	Good	Good	Fair	Fair
28	29+305	Good	Fair	Fair	Fair
29	29+471	Good	Good	Fair	Fair
30	30+778	Good	Fair	Fair	-
31	31+038	Good	Good	Fair	-
32	32+496	Good	Good	Fair	-
33	33+533	Good	Good	Fair	-
34	36+385	Good	Fair	Fair	-
35	36+939	Good	Good	Fair	-

S. No.	Chainage (Km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
36	39+175	Good	Good	Fair	-
37	39+736	Good	Fair	Fair	-
38	39+917	Good	Good	Fair	-
39	42+339	Good	Good	Fair	-
40	42+696	Good	Good	Fair	-
41	43+576	Good	Fair	Fair	Fair
42	45+484	Good	Good	Fair	Fair
43	46+457	Good	Fair	Fair	Fair
44	47+423	Good	Fair	Fair	Fair
45	48+686	Good	Good	Fair	Fair
46	53+494	Good	Good	Fair	Fair
47	53+76	Good	Fair	Fair	Fair
48	54+458	Good	Good	Fair	Fair
49	55+914	Good	Fair	Fair	Fair
50	56+068	Good	Good	Fair	Fair
51	56+35	Good	Fair	Fair	Fair
52	58+381	Good	Good	Fair	Fair
53	61+768	Good	Good	Fair	Fair
54	62+061	Good	Good	Fair	Fair
55	62+802	Good	Fair	Fair	Fair
56	67+356	Good	Good	Fair	Fair
57	69+221	Good	Fair	Fair	Fair
58	69+516	Good	Fair	Fair	Fair
59	71+754	Good	Good	Fair	Fair
60	76+886	Good	Fair	Fair	Fair

Annexure 4: Toll Revenue Calculations

1. Tollable Traffic considered for Toll Revenue in No.s (AADT):

Table.1: Details of Tollable Traffic (Base Year 2019-20)

Vehicle Type	Traffic (AADT) Km. 12+000	Traffic (AADT) Km. 75+900
Car/Taxi/Van	281	305
LCV	74	123
Bus	40	11
Truck	13	9
MAV	35	39

2. Traffic Growth Rates

Table.2: Details of Growth rates adopted

Year	Car	LCV	BUS	Truck	MAV
2019-25	5.00	5.00	5.00	5.00	5.00
2025-30	5.00	5.00	5.00	5.00	5.00
2021-22	5.00	5.00	5.00	5.00	5.00
2022-23	5.00	5.00	5.00	5.00	5.00
2023-24	5.00	5.00	5.00	5.00	5.00

3. Trip Distribution Ratio as per the Toll Data.

Table.3: Details of Trip Distribution (Base Year 2019-20)
Mawai & Bela:

Vehicle Type	Single Trip	Local Pass	Total
Car/Taxi/Van	98%	2%	100%
LCV	100%		100%
Bus	100%		100%
Truck	100%		100%
MAV	100%		100%

4. Toll Rates :

Table.4: Details of Toll Fee (Base Year 2019-20)

Vehicle Type	Toll Fee at Km. 12+000 & Km. 75+900
Car/Taxi/Van	45
LCV	110
Bus	225
Truck	270
MAV	540

Note: There are two numbers of toll plazas existing on the project road. One booth of the toll plaza in each direction is used for Toll Ticket issue & Checking as well.

Toll Plaza-1 Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	4521195	159755	2924455	3310400	1290945	6864275	19071025	190.710	190.710
2020-21	4747255	178227	3124853	3623030	1400322	7453521	20527207	205.272	395.982
2021-22	5538464	187138	3430236	3966062	1549106	8175580	22846586	228.466	624.448
2022-23	5815387	208053	3758345	4334339	1681699	8877842	24675666	246.757	871.205
2023-24	6106156	230593	4110690	4640292	1823679	9629890	26541301	265.413	1136.618
2024-25	7052611	242122	4488874	5059703	1975652	10434949	29253911	292.539	1429.157
2025-26	7405241	267609	4894599	5509455	2138263	11381375	31596542	315.965	1745.122
2026-27	8482367	280989	5329674	5991532	2312197	12307173	34703933	347.039	2092.162
2027-28	8906486	309791	5596158	6508043	2533363	13297098	37150939	371.509	2463.671
2028-29	9351810	340770	6085822	6947336	2733921	14453571	39913230	399.132	2862.803
2029-30	10637684	357808	6610462	7533874	2948202	15589209	15436613	154.366	3017.170

Toll Plaza-2 Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	4902300	177035	4850760	897820	858595	7640225	19326735	193.267	193.267
2020-21	5147415	197505	5430852	980831	931686	8293599	20981888	209.819	403.086
2021-22	6005318	207380	5950325	1073697	1013209	9097041	23346969	233.470	636.556
2022-23	6305583	230558	6508168	1150390	1100554	9878453	25173706	251.737	888.293
2023-24	6620863	255535	7106919	1256226	1213361	10715265	27168168	271.682	1159.975
2024-25	7647096	268311	7462265	1369769	1314474	11701069	29762985	297.630	1457.605
2025-26	8029451	296555	8136739	1491526	1422666	12664157	32041094	320.411	1778.015
2026-27	9197371	311383	8860005	1622035	1538390	13694301	35223484	352.235	2130.250
2027-28	9657240	343299	9635255	1732501	1662130	14899995	37930420	379.304	2509.554
2028-29	10140102	377629	10465881	1880792	1794398	16082617	40741418	407.414	2916.969
2029-30	11534366	396511	11355481	2039580	1961547	17346251	44633735	157.747	3074.715

Summary:

Toll Plaza-1 & 2 Total Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	9423495	336790	7775215	4208220	2149540	14504500	38397760	383.978	383.978
2020-21	9894670	375731	8555705	4603862	2332008	15747119	41509094	415.091	799.069
2021-22	11543781	394518	9380561	5039759	2562315	17272621	46193555	461.936	1261.004
2022-23	12120970	438611	10266513	5484729	2782253	18756295	49849372	498.494	1759.498
2023-24	12727019	486127	11217609	5896518	3037040	20345155	53709468	537.095	2296.592
2024-25	14699707	510434	11951139	6429473	3290126	22136018	59016896	590.169	2886.761
2025-26	15434692	564164	13031338	7000981	3560929	24045532	63637636	636.376	3523.138
2026-27	17679738	592372	14189679	7613567	3850587	26001474	69927417	699.274	4222.412
2027-28	18563725	653090	15231413	8240545	4195493	28197093	75081359	750.814	4973.226
2028-29	19491912	718399	16551702	8828128	4528319	30536188	80654648	806.546	5779.772
2029-30	22172049	754319	17965942	9573454	4909749	32935460	60070348	312.113	6091.885

Annexure 5: Operation & Maintenance Cost

Routine Maintenance cost for 1 year

S No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
1	General Cleaning in Carriageway & Shoulders Rural area	Monthly	Km.	76.4	12	4	350	12,83,520	04 nos of Labour
2	General Cleaning in Carriageway & Shoulders Urban area	Twice in a month	Kms	15.5	24	4	350	5,20,800	04 nos of Labour
3	Watering in Median Plants	Once in Week	Km.	15.5	52	1	1939	15,62,834	01 nos of Labour
4	ROW Cleaning	Half yearly	Km.	38.2	2	5	350	1,33,700	5 Nos of labour per KM (50% of the Project length)
5	Cleaning of Culverts	Half yearly	Nos	96	2	2	650	2,49,600	3 nos of Labour along with JCB or Excavator
6	Road Furniture Cleaning	Quarterly	Km.	76.4	4	1	350	1,06,960	02 nos of Labour
7	Maintenance of Bus shelters	Monthly	Nos	8	6	1	350	16,800	2 nos/ Bus shelter/month
8	General Cleaning in Building & Facilities	Daily	Nos	1.00	6	15	350	31,500	02 nos of Labour for 30 days
9	Bridges	Half yearly	Nos	12	2	2	350	16,800	02 nos of Labour for removal of vegetation/Structure
								39,22,514	
	EQUIPMENT SUPPLY							-	
1	TRUCK TIPPER 6-8 CUM CAPACITY	Monthly	Nos	1	12	1	15000	15,000	(2000000 is the cost of vehicle, considering 10% Rental per year) including maintenance
2	Grass cutter	Monthly	Nos	3.2	12	0	12000	1,920	(12000/year)

S No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
3	Bikes	Monthly	Nos	2	12	0	2500	4,000	Per Supervisor/Per Month
4	Toll plaza AMC	Yearly	Nos		12	1	5000	60,000	10000/month
								65,920	

1	Patrolling vehicle	Monthly	Nos	12			150000	150000	(1500000 is the cost of vehicle, considering 10% Rental per year) including maintenance
2	Ambulance	Monthly	Nos	12		2	10000	20000	(1200000 is the cost of vehicle, considering 10% Rental per year) including maintenance (1 Ambulance/toll plaza)
3	Consumables for Medical Aid Post and Ambulance	Monthly	Nos	12		1	5000	60000	2500 Per month for per set (Per set - Per toll plaza)
4	Consumables for Route Patrolling & Crane	Monthly	Nos	12		1	5000	60000	2500 Per month for per set (Per set - Per toll plaza)
								2,90,000	
								42,78,434.00	

Incidental cost for 1 year

S. No.	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks

S. No.	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks
1	Road marking	Half yearly	Sqm.	1	1	1857	516	9,58,212	10 % of Total Project length on B/S for 1 year
2	Maintenance of Earthen Shoulder	Half yearly	Cum.	1	3	1146	225	7,73,550	5% of total Shoulder length throughout the project
3	Sign Board	Quarterly	Km.	1	1	13	4000	52,000	2.5 % of Total sign boards per half year (considered 500 Nos.)
4	MBCB	Monthly	RMT.			37.5	2400	90,000	2.5% of Total qty per year - (considered 2400 per number)
5	Mile Stone (KM Stone/ HM Stone / ROW stone etc.)	Quarterly	Nos.	76.4	4	19	2250	1,71,000	5 % of total stones per year (unable to understand the backup)
							Total amount for 1 Year	**20,44,762**	

Operational Expenses

S. No.	Particulars	Amount
1	Man Power	₹ 49,92,000
2	Fuel for Generator & Vehicles	₹ 29,52,000
3	Electricity	₹ 3,30,000
4	Stationary	₹ 10,000
5	Replacement of Electrical Fixtures	₹ 37,760
6	Refurbishment of Toll Plaza Equiment	₹ 75,000
	Total Amount	₹. 83,96,760

Summary of Major Maintenance

Description	Due date	Base cost	Esc Period	Escalation Rate per Year	Cost of MMR on due date @ 5% Escalation	In crores
Date of Estimation	20-01-2021					
Major Maintenance - Highway	01-04-2022	11,69,48,590	1.20	3.0%	12,11,58,739	12.12
Major Maintenance - Highway	01-04-2029	11,69,48,590	8.20	3.0%	14,57,17,943	14.57
				Total	**₹ 26,68,76,682**	**26.69**

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.			-			-	
(a)	On Bituminous surface @ 2.0 kg to 3.0 kg/10 sq.m.	Sqm.	-	14.00		-	14.00	
2	Providing and layingSemi dense 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.	-	7,480.00		-	7,480.00	
	Providing and layingSemi dense bituminous concrete using a batch type Hot Mix Plan	Cum.	8,186.25	6,800.00	5,56,66,500	8,186.25	6,800.00	5,56,66,500

3	Micro surfacing	Sqm.	2,79,450.00	185.00	5,16,98,250	2,79,450.00	185.00	5,16,98,250
4	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	
5	Texturing of Rigid pavement (considering 50% for 7 years)	Sqm.	-	130.00		-	130.00	
	Total				**10,73,64,750**			**10,73,64,750**
	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 representative. - **Consider 5% for construction period.**	RMT.	-	380.00		-	380.00	
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.	18,573.33	516.00	95,83,840	18,573.33	516.00	95,83,840
3	Road Studs	Nos.	-	750.00		-	750.00	
4	Kerb painting		-	250.00		-	250.00	
	Total			-	**95,83,840**		-	**95,83,840**
	Grand Total				**11,69,48,590**			**11,69,48,590**

Annexure 6: Letter of Acceptance

MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LIMITED
(Govt. of M.P. Undertaking)
16-A, Arera Hills, Bhopal - 462 011
Tel.: (O) 0755-2766196, 205, 213, 216 (EPBX) Fax : 91-755-2572843
Website : www.mprdc.nic.in.

No. MPRDC/BOT/T-J-P-N/2013/ 8273
Bhopal, dated 27 September,2013

M/s Dilip Buildcon Ltd.,
E-5/99, Arera Colony,
Bhopal
Fax: 4247574

Sub: **Development of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon Road on BOT (Toll+Annuity) basis**

In response to your Pre-Qualification you have submitted Technical and Financial Bid for development of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon Road on BOT (Toll+Annuity) basis. In this connection, kindly refer to the clarification, addendum etc. issued from time to time before submission of the tender document.

Also refer to your bid documents containing an unconditional price bid of Rs. **8,91,00,000.00 (Rupees eight crores ninety one lacs only)** as Annuity Amount payable in terms of Clause 25 of the Concession Agreement.

Pursuant to our acceptance of your tender and decision to award the work to you, we request you to send your acceptance and sign the Concession Agreement within the time stipulated in the Tender.

Yours faithfully

Encl: **Duplicate copy of LoA for acknowledgement**

(Arun Paliwal)
General Manager

Connecting People Through quality infrastructure

Annexure 7: Provisional Completion Certificate

HEC Civil Consultancy Services

HIGHWAY ENGINEERING CONSULTANT

Project Office : 4, Sunrise Residency, Rajghat Road, Sagar (M.P.) Mob. 9753923583, 07582-298029
Email: hecsagar@gmail.com

Ref. No. (1) HEC/Sagar/TJPN Rd./Rd. F-2/1247

Date : 26/05/2015

To,
The Project Manager
M/S DBL Tikamgarh-Nowgaon Tollways Ltd.
Jatara Distt.- Tikamgarh (M.P.)
Email ID :- tyagiramavtar45@gmail.com

Subject: - Development of Tikamgarh (Dhairai)-Jatara-Palera-Nowgaon Major District Road on BOT (Toll+Annuity) basis **regarding Provisional Completion Certificate.**

Reference: - (i) Your letter no. DBL/TJPN/HEC/MPRDC/14-15/207 dated 26/04/2015.
(ii) Your letter no. DBL/TJPN/HEC/MPRDC/14-15/230 dated 11/05/2015.

Dear Sir,

The Provisional Completion Certificate Dated 26/05/2015 in respect of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon road project, is sent herewith for your reference and record.

Please acknowledge receipt
Enclosure: Provisional Completion Certificate with Punchlist.

Thanking you.
Your faithfully,

(Rajendra Kumar Goyal)
Team Leader
Highway Engineering Consultant
Sagar (M.P.)

Copy to :- i) Personal Assistance to the Managing Director, MPRDC, Bhopal (M.P.)
ii) The Chief Engineer, MDR, MPRDC, Bhopal (M.P.)
iii) The Divisional Manager, MPRDC, Sagar (M.P.).
iv) The Director M/S DBL Tikamgarh-Nowgaon Tollways Ltd. Bhopal (M.P.)
v) The Director HEC, Bhopal, (M.P.)
vii) The Resident Engineer, HEC Tikamgarh (M.P.).
viii) BE / ME / HE, HEC, Sagar, (M.P.)
xi) File copy – Road / Gen & C.A

Enclosure: Provisional Completion Certificate with Punchlist.

Annexure 8: Completion Certificate

HIGHWAY ENGINEERING CONSULTANT

Civil Consultancy Services

Project Office : 4, Sunrise Residency, Rajghat Road, Sagar (M.P.), Mob.: 9753923583, 07582-298029
Email: heceagar@gmail.com

Ref. No. **Date :** 13.08.2015.

COMPLETION CERTIFICATE

1) I, RAJENDRA KUMAR GOYAL acting as Independent Engineer, under and in accordance with the Concession Agreement dated 12.11.2013 for intermediate laning of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon MDR. from KM 0.000 to 77.515 on build, operate and transfer (BOT) Toll + Annuity basis, through M/s DBL Tikamgarh-Nowgaon Tollways Ltd., hereby certify that the Tests specified in Article 14 and Schedule-I of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in commercial service of Users thereof.

2) It is certified that in terms of the aforesaid Agreement, all works forming part of Intermediate Laning and Four-Laning have been completed, and the Project Highway is hereby declared fit for entry in to commercial operation on this the 13th day of August 2015.

Signed, Sealed and Delivered
For and on behalf of Independent Engineer by

(Rajendra Kumar Goyal)
Team Leader
Highway Engineering Consultant
Sagar (M.P.)

Head Office : T-10, IIIrd Floor, City Centre, Press Complex, Plot No.1, M.P. Nagar Zone-I, BHOPAL (M.P.) 462011
Phone/Fax : 0755-4295421, Email : hec_bhopal@rediffmail.com

Annexure 9: Insurance Details

पॉलिसि अनुसूची/ Policy Schedule - Civil Engineering Completed Risk

Policy Number:
321300441910001992

जारीकरण 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: 23AAACN9967E1ZB
Contact Number: 755 2682822
eMail: 321300@nic.co.in
Mobile Number:

व्यवसाय सूत्रधार /Business Source: 910355
बिक्रय चैनल कोड/**Sales Channel** Code: 91035500000001
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 TIKAMGARH NOWGAON TOLLWAYS LTD
पता/ Address: PLOT NO-5, INSIDE GOVIND NARAYAN SINGH GATE, CHUNA BHATTI, KOLAR ROAD, BHOPAL-462016, City: BHOPAL, District: BHOPAL, State: MADHYA PRADESH, PIN: 462016
Cell: 9826292328

ग्राहक आईडी /Customer ID: 9701881844
फोन /Phone:
ई-मेल /E-Mail:
पैन /PAN: AAECD8604L

पॉलिसि: 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	₹ 11,65,113.00	कवर नोट संख्या और तारीख/ Cover Note Number and Date	NA
CGST	₹ 1,04,860.00		
SGST/UTGST	₹ 1,04,860.00		
IGST	₹ 0.00		
केरला बाढ़ उपकर/Kerala Flood Cess	₹ 0.00	प्रस्तावना संख्या और तारीख/Proposal Number and Date	880020O327086953 Dt. 27/03/2020
कम जीएसटी_टीडीएस / Less:GST_TDS	₹ 0.00		
पुनर्प्राप्ति योग्य स्टाम्प ड्यूटी /Recoverable Stamp Duty	₹ 0.00	रसीद संख्या और तारीख/Receipt Number and Date	321300811910007666 Dt. 27/03/2020
कुल /Total Amount	₹ 13,74,833.00	पिछली पॉलिसी संख्या और समाप्ती तारीख/ Previous Policy Number and Expiry Date	NA

(Rupees Thirteen Lakh Seventy Four Thousand Eight Hundred Thirty Three Only.)
Location: Tikamgarh(Dhajrai) Jatara- Palera-Nowgaon Road, Madhya Pradesh Tikamgarh, Tikamgarh, 472001.

Sr.No	Type of Risk	Description Of Risk	Earthquake Zone	Sum Insured of the risk(₹)	Excess(₹)
1	Roads	ROAD AND STRUCTURE Toll Building & Booths, TMS, HTMS, Office & It Equipment, Electronic Equipment, Road Furniture, Fixturs, Electrical Poles Lighting & Fittings, Signboard & Safety Barrier	Zone IV	1,06,71,11,000.00	1,00,000.00
2	Roads		Zone IV	9,82,69,000.00	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.

Printed on 27/03/2020 by ID: 75159

Page no: 1

HDFC ERGO General Insurance Company Limited

May 13, 2020

DBL TIKAMGARH NOWGAON TOLLWAYS LTD

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

Dear Customer,

Sub: Employees Compensation Insurance Policy No: 3114203387673800000

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

3114203387673800000 Page 1 of 13

HDFC ERGO General Insurance Company Limited (Formerly HDFC General Insurance Limited) UIN : IRDAN125P0017V02201112 | IRDAI Reg No.146 | CIN : U66030MH2007PLC177117

Registered & Corporate Office:
1st Floor,HDFC House, 165 - 166 Backbay Reclamation,
H. T. Parekh Marg, Churchgate, Mumbai - 400 020

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

HDFC ERGO General Insurance Company Limited

Certificate of Insurance cum Policy Schedule

Policy No. 3114203387673800000 **Employees Compensation Insurance**

Insured Name	DBL TIKAMGARH NOWGAON TOLLWAYS LTD (PAN Number:AACCD6124B)					**Business**	OTHERS
Correspondence Address	PLOT NO. 5, GOVIND NARAYAN SINGH GATE,CHUNA BHATTI, BHOPAL,BHOPAL,MADHYA PRADESH,462016.						
Mobile		**Phone**		**E Mail**		**Policy Issuance Date**	13/05/2020

Period of Insurance	From Date & Time	19/05/2020 00:01 AM	To Date & Time	18/05/2021 Midnight

LAW

The Policy covers Liability of the Insured under the following Law(s) shown as covered, subject to claim being otherwise admissible as per terms, conditions and exclusions of the Policy and subject to Limit of Indemnity as stipulated against each Law:

Sr. No.	Law	Limit of Indemnity
a.	Employee's Compensation Act, 1923 and subsequent amendments thereof prior to the date of issue of this Policy	Subject otherwise, to the terms, conditions & Exclusions of the Policy, the amount of liability incurred by the Insured
b.	Common Law	Subject otherwise, to the terms, conditions & Exclusions of the Policy, the amount of liability incurred by the Insured, but not exceeding:-
		a) Limit Per Employee for any number of accidents during Period of Insurance ₹. Unlimited
		b) Limit Per Accident for any number of Employees ₹.Unlimited
		c) Aggregate Limit for all accidents and claims arising there from during the Period of Insurance ₹.Unlimited

EC-13-0005

3114203387673800000 Page 2 of 13

This Document is Digitally Signed
Signer: ATUL JERATH
Date: Fri, Nov 6, 2020 14:35:35 IST
Location: NOIDA
Reason: Signing Policy for OICL

ELECTRONIC EQUIPMENT INSURANCE POLICY SCHEDULE

Policy No	: **171200/44/2021/47**	**Prev Policy No**	:
Cover Note No	: ER1700203540	Cover Note Dt	: 08/09/2020
Insured's Code	: 96715840	Issuing Office Code	: 171200
Insured's Name	: DBL TIKAMGARH NOWGAON TOLLWAY LTD. (GSTIN: 23AAECD8604L1ZM)	Issuing Office Name	: CBU Vadodara (GSTIN: 24AAACT06
Address	: Plot No. 5, Inside Govind Narayan Singh Gate, Chuna Bhatti, Kolar Road, Bhopal, Madhya Pradesh- 462016	Address	: Ist FLOOR, KIRTI TOWER, TILAK ROAD VADODARA GUJARAT 390001
Tel /Fax /Email	: / / 0 / avni.sheth@unisoninsurance.net BHOPAL 462016	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_IND 3214000879 - 23/09/2020 GST INVOICE NO :2419502812 UIN :0

Gross Premium : 2,510 GST : 452 Stamp Duty : 1 Total : 2,962

RISK DETAILS

Section I : EEI - EQUIPMENT

Sum Insured : 55,78,190

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

MADHYA PRADESH - 472001

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		55,78,190

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

Attached to and forming part of policy number 171200/44/2021/47

Signer: ATUL JERATH
Date: Fri, Nov 6, 2020 14:36:35 IST
Location: NOIDA
Reason: Signing Policy for OICL

2) Winchester Drive and/or Hard Disc-25% of claim amount subject to a minimum of Rs.10,000/-

In case of computers, the term 'equipment' shall include the entire computer system comprising of CPU, Key boards, Monitors, Printers, Stabilizers, UPS.

SCHEDULE OF PREMIUM

Cover Description	Premium
TOTAL PREMIUM	2,510
ADD :IGST	452
STAMP DUTY	1
TOTAL AMOUNT	2,962

Total Sum Insured In Words : Indian Rupees Fifty-Five Lakhs Seventy-Eight Thousand One Hundred Ninety Only
Total Amount Paid : Indian Rupees Two Thousand Nine Hundred Sixty-Two Only

The Insurance under this policy is extended to cover risks of (as per forms attached):
EAR - EARTHQUAKE COVER
STFI Inclusion Cover

Excess / Deductible :
The following minimum deductibles are applicable based on Sum Insured of the policy

The Insurance under this policy is subject to warranties & Clauses (as per forms attached) :
In the event of a claim under the policy exceeding Rs.1lac or a claim for refund of premium exceeding Rs1lac,the insured will comply with the provisions of the AML policy of the Company.The AML policy is available in all our operaing Offices as well as company's website.
Communicable Disease Exclusion Clause
Exclusion-Any Direct or indirect loss by infectious or contagious disease

The insurance under this policy is subject to conditions, clauses, warranties, endorsements as per forms attached.

Warranted that in case of dishonour of premium cheque(s) the Company shall not be liable under the policy and the policy shall be void abinitio (from inception).

In witness whereof the undersigned being authorised by and on behalf of the company has/have herein to set his/their hands at CBU Vadodara (GSTIN: 24AAACT0627R2Z4) on 22ND DAY OF SEPTEMBER 2020

For and on behalf of
The Oriental Insurance Company Limited

Entered By : FARHAN KHAN
Examined By : A K Parmar

Authorised Signatory

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 2 of 2

Annexure 10: Change of Scope

Development of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon Road (MDR) on BOT (Toll+Annuity) basis

Road width in Built up areas.

Sr.No.	Provision as per Schedule-B					Construction proposed by Concessionaire as per site condition				Reasons & recommendation by Independent Engineer	Decision of Committee
	Village Name	Chainage From	Chainage To	Length in mtr	Width to be paved drain to drain (mtr.)	From	To	Length in mtr	Width to be paved drain to drain (mtr.)		
1	2	3	4	5	6	7	8	9	10	11	12
	Project Length	76.400 Km				77.515 Km				This project has been developed in BOT (Toll+Annuity) scheme. Toll rights of increased length 1.115 Km has been given to the concessionaire. Necessary decision regarding increased length as change of scope may be taken by the Advisory committee as per provision of Concession Agreement.	
1	Dhajrai	0	400	400	15.00	0	400	400	15.00	In the schedule B, article 2.2 table B-2 ,on page 20, the width to be paved in built up areas is proposed as per fig. 2.3 of schedule D i. e. 12m. drain to drain in available ROW. The paved width was adopted as per schedule i. e. 12m. drain to drain.	
2	Mawai	2420	5020	2600	15.00	2418	4949	2531	15.00		
3	Majna	9720	10720	1000	15.00	9731	10723	992	15.00		
4	Lar Khurd	17700	18700	1000	15.00	17710	18748	1038	15.00		

5	Diwar /Khargupura	36950	37950	1000	15.00	36945	37900	955	15.00	(Excluding drains).Hence it is recommended to consider 102m. Reduced length as negative change of scope.	
6	Simra Khurd	38420	40420	2000	15.00	38261	40350	2089	15.00		
7	Laron (Aalampar)	63240	64240	1000	15.00	63219	64187	968	15.00		
8	Garroli	68240	69240	1000	15.00	68160	69145	985	15.00		
9	Dharangpura (Nowgaon Tigaila)	76415	77515	1000	15.00	76573	77515	940	15.00		
Total				**11000**				**10898**	**102**		
1	Jatara Town	-	-	-	-	32650	33530	880	RHS	The single cell open drain was constructed by concessionaire as per site requirement and as per the directions given by the DivisionalManager,MPRDC, Sagar on complaint of villagers through CM helpline. Hence the total length of 1657m of drain may be considered as positive change of scope.	
2	Barana Village	-	-	-	-	42835	43276	401	BHS		
3	Barana Village	-	-	-	-	43173	43282	109	BHS		
4	Sanjay nagar	-	-	-	-	48525	48654	129	BHS		
5	Garrouli Village	-	-	-	-	67985	68123	138	BHS		
Total								1657			
Sr.No.	Provision as per Schedule-B					Construction proposed by Concessionaire as per site condition				Reasons & recommendation by Independent Engineer	Decision of Committee

	Village Name	Chainage From	Chainage To	Length in mtr	Width in mtr.	From	To	Length in mtr	Width in mtr.		
1	2	3	4	5	6	7	8	9	10	11	13
10	Jatara Town	29900	33009	3109	5.5	(a) 29900	31200	1300	10	Intermediate lane was propsoed in Jatara Town portion, but the stretch comes under buil up reach. Two lane pave shoulder was constructed in Jatara Town Portion except stretch from Ch. 31200 to 32000 where availability of ROW was only 6 mtr. Stretch from chainage 32+454 to chainage 33+009 passes through the bank of pond one side and hill at another side. Existing carriageway in this reach was rigid pavement of 3.5 to 4 mtr width, which was considered as DLC and the road was widened to 10 mtr. It is recommended to consider difference of cost as positive change of scope.	
						(b) 31200	32000	800	6		
						(c) 32000	32454	454	10		
						(d) 32454	33009	555	10 (Rigid Pavement)		

11	Palera Town 4 Lane	52500	57000	3100	11 Line Flexible	52500	57000	3400	4 Lane Rigid	There was existing rigid pavement of approx 3.5 mtr width carriageway with median of regular width and in damaged condition in Palera Town portion. Four lane rigid pavement has been constructed with reconstruction of 1.5 mtr median. Existing carriageway of rigid pavement was considered as DLC and the road is widened to four lane of rigid pavement. It is recommended to consider difference of cost as change of scope.	

Drain in built up areas

Sr.No.	Provision as per Schedule-B				Side	Construction proposed by Concessionnaire as per site condition			Side	Reasons & recommendation by Independent Engineer	Decision of Committee
1	2	3	4	5	6	7	8	9	10	11	12
	Palera (Four Lane)									There is a two cell drain was proposed in built up stretch as per Cl.2.3 of schedule-B for	

1	[illegible]	0	400	400	B/S	0	399	420	B/S	two long paved shoulder drain to drain. Concessionaire has constructed the same section of two cell drain shown in the table. Due to lesser length (750mtr) of Drain Constructed, it is recommended to consider as (-) negative change of scope. In fig. 2.2 of schedule-D for four lane section there was no mention of drain. As per clause 2.6 of schedule-B states - **Drainage - The drainage in open country** and built up area shall be as per manual of standard and specification for two lane with earthen shoulder schedule-D. In built up area covered and pipe drains with main holes at suitable interval the pipes should be provided. Such drains shall be accommodated below the footpath if additional land is not available. **Only one side drain providing which does not required additional land.** Concessionaire has not constructed any drainage in four lane section of Palera Town portion, which comes under built up area and drainage should be ensured by the concessionaire as per clause 2.6 of schedule-B. Construction of drain o
2	Mawai	2420	5020	2600	B/S	2418	4909	2491	B/S	
3	Majua	9720	10720	1000	B/S	9731	10723	992	B/S	
4	Lar Khurd	17700	18700	1000	B/S	17710	18748	1038	B/S	
5	Diwau /Khargapura	36950	37950	1000	B/S	36945	37739	794	B/S	
6	Sirora Khurd	38420	40420	2000	B/S	38261	39077	816	B/S	
						39187	39770	583		
						39280	39930	150		
						39935	40187	252		
7	Laron	63240	64240	1000	B/S	63219	64158	939	B/S	
18	Garroli	68240	69240	1000	B/S	68180	69095	915	B/S	
9	Dharampura (Nowgaon bagaria)	76515	77515	1000	B/S	76525	77465	940	B/S	

								urgently required in this four lane section. Moreover, construction of footpath in four lane section has also not been constructed which was clearly mention in fig. 2.2 of schedule-D. It is recommended to ask concessionaire to ensure drainage in Palera four lane sections and footpath construction should also be done.	
	Total length =	11000				10250			

Team Leader
Highway Engineering Consultant
Bhopal Division
Bhopal (M.P.)

Development of Tikamgarh (Dhajrai)-Jatara-Palera-Nowgaon Road (MDR) on BOT (Toll+Annuity) basis

Cross Drainage Works

Sr. No.	Inventory sr no.	Chainage		Provision as per Schedule-B			Construction proposed by Concessionaire as per site condition			Reasons & recommendation by Independent Engineer	Decision of committee
		Existing	Design	Proposal	Type of structure	Span arrangement	Proposal	Type of structure	Span arrangement	(-) &(+)Ve COS	
1		2	3	4	5	6	7	8	9	11	13
						(1) Minor Bridges					
1	9	Extra	05+255	-	MNB	-	New construction	Minor Bridge	3x5 mtr.	On this spot, the arch slab culvert 3x2.30mtr.was found at site but in schedule-B no structure was proposed. The hydraulic data were observed and found the requirement of Minor Bridge 3x5.00 mtr. Hence the proposal of new construction was adopted on the ground of the requirement and existing cross drain a arched culvert 3x2.3m. .Catchement area-7sqkm and linear water way 15.mtr. Recommended for positive change of scope.	
2	39	34/4	23+951	Reconstruction	Box Culvert	1x4 mtr.	Reconstruction	Minor Bridge	2x4.5 mtr.	In the schedule B page no. 29 serial no 10 Span arrangement changed. No Change of Scope as per note – page no. 41 of schedule B linear water way 8.93mtr. catchment area 5.3sq km.	
3	43	36/6	26+176	Reconstruction	Box Culvert	1x4 mtr	Reconstruction	Minor Bridge	1x8. mtr	In the schedule B page no. 27 serial no 12 Span arrangement changed. No Change of Scope as per note – page no. 41 of schedule B linear water way 7.99. catchment area 6.70sq km.	
4	62	55/2	40+251	Reconstruction	Box Culvert	1x6 mtr	Reconstruction	Minor Bridge	2x4. mtr	In the schedule B page no. 27 serial no 14. Span arrangement changed. No Change of Scope as per note – page no. 41 of schedule B linear water way 8.00 mtr.. catchment area 2.042sq km.	
5	80	18/2	51+666	Reconstruction	MNB	2x5 mtr	Reconstruction	Minor Bridge	3x6.5 mtr	In the schedule B page no. 40 serial no 2 Span arrangement changed. No Change of Scope as per note – page no. 41 of schedule B linear water way 17.677 mtr.. catchment area 27.04sq km.	

(2) Slab Culvert

7	48	41/2	30+778	Reconstruction	HPC	1 X 1.20	Retained	Slab Culvert	1 x 0.90x1.5mtr	In the schedule B-6-b(a) (ii) page no. 29 serial no. 29 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required ,hence the existing structure was retained. Recommended for (-ve) negative change of scope for HPC 1x1200mm..width-10mts	
8	49	41/4	31+038	Reconstruction	HPC	1 X 1.20	Retained	Slab Culvert	1x0.90x1.4 mtr	In the schedule B-6-b(a) (ii) page no. 33 serial no. 30 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required, as such there was no defined nala /stream at site. Hence the existing structure was retained .Recommended for (-ve) negative change of scope for HPC 1x1200mm..width-10mts	
9	53	42/2	35+713	Reconstruction	HPC	1 X 1.20	Retained	Slab Culvert	1x1.35x1.9mtr	In the schedule B-6-b(a) (ii) page no. 33 serial no. 33 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required as such there was no defined nala /stream at site. ,Hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm..width-12mts	
10	54	42/6	36+097	Reconstruction	HPC	1 X 1.20	Retained	Slab Culvert	1x1.30x1.10 mtr	In the schedule B-6-b(a) (ii) page no. 33 serial no. 34 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required , hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm width-12mts	
11	56	Extra	36+527				widening	Slab Culvert	1x1.30x1.2mtr	In the schedule in schedule no structure was proposed but slab culvert 1x1.30 mtr was found in good condition, hence the existing structure was retained and widened .Recommended for (-ve)	

										with 12mts positive change of scope for widening. In the schedule B page no. 40 serial no. 4 Span arrangement charged. No Change of Scope as per note – page no. 41 of schedule B linear water way required 6.00 meter., catchment area 1.924 km. In the schedule B-6-b(a) (ii) page no. 32 serial no. 22 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required, hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm, width-12mts In the schedule B-6-b(a) (ii) page no. 32 serial no. 20 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required , hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm, width-12mts Mention in Schedule 6-b(b)(iii) page no. 35 serial no. 8,9,& found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a Positive change of scope for widening, width-12mts. In the schedule B-6-b(a) (ii) page no. 31 serial no. 17 the HPC was proposed for reconstruction but the existing structure was found in good condition having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a (+ve) positive change of scope for proposed structure as per
13	60	35/m	29+330		-	-	Widening	Slab	1 X 1.0x1.20mtr	Not Mention in Schedule A & B. But SC 1x1.0 found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr.. It is recommended to consider as a Positive change of scope for widening. width-12mts	
14	63	36/6	41+219	Reconstr uction	MNB	1x8 mtr	Reconstruc tion	Box Culvert	1x6 meter	In the schedule B page no. 40 serial no 4.Span arrangement charged. No Change of Scope as per note – page no. 41 of schedule B linear water way required 6.00 meter., catchment area 1.924 km.	
15	66	36/10	43+186	Reconstr uction	HPC	1 X 1.20	Retained	Slab Culvert	1x2.50x1.0 mtr	In the schedule B-6-b(a) (ii) page no. 32 serial no. 22 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required, hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm, width-12mts	
16	67	38/2	43+575	Reconstr uction	HPC	1 X 1.20	Retained	Slab Culvert	1x3.50x1.0m tr	In the schedule B-6-b(a) (ii) page no. 32 serial no. 20 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required , hence the existing structure was retained Recommended for (-ve) negative change of scope for HPC 1x1200mm, width-12mts	
17	71	25/2	46+331	Retained	SC	1x6	Widening	Slab	1 X 6.0x2.0mtr	Mention in Schedule 6-b(b)(iii) page no. 35 serial no. 8,9,& found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a Positive change of scope for widening, width-12mts.	
18	72	25/8	46+457	Reconstr uction	HPC	1X 1.20	Retained	Slab Culvert	1 X8.0x1.5 meter	In the schedule B-6-b(a) (ii) page no. 31 serial no. 17 the HPC was proposed for reconstruction but the existing structure was found in good condition having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a (+ve) negative change of scope for proposed structure as per	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] Culvert	[illegible]	Schedule B [illegible] 12mts [illegible] the existing structure was found in good condition and reconstruction was not required, hence the [illegible] Recommended for (-ve) negative change of scope. For HPC 1x1200mm. width-12mts	
20	87	15/2	52+700	Retained	SC	1x4	Deleted	—	—	Mention in Schedule 6-b(b)(iii) page no. 27 serial no.16. the s/c was proposed for reconstruction but at site no structure was found. Reconstruction was not required; as such there was no defined nala /stream at site. Recommended for (-ve) negative change of scope for s/c 1x4.0 m	
21	91	14/8	56+740	Reconstruction	SC	1x4	Deleted		—	Mention in Schedule 6-b(b)(iii) page no. 28 serial no.17. the s/c was proposed for reconstruction but no structure was found at site. Reconstruction was not required; as such there was no defined nala /stream at site. Recommended for (-ve) negative change of scope for s/c 1x4.0 m	
22	92	Extra	56+999	-	-	-	Widening	Slab	1 X 3.00x1.0 meter	Not Mention in Schedule A & B. But found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a Positive change of scope for widening and slab replacement.	
23	93	Extra	57+950	-	-	-	Widening	Slab	1 X 3.00x1.0 meter	Not Mention in Schedule A & B. But found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It was recommended to consider as a Positive change of scope for widening and slab replacement.	
24	94	Extra	58+381	-	-	-	Widening	HPC	1 X 1.0 meter	Not mention in Schedule A & B. But found at site having carriageway width less than 7.5 meter. Hence widening done for 12mtr. Consider positive change for widening and slab replacement.	
25	95	Extra	58+688	-	-	-	Widening	Slab	1 X 2.00x1.0 meter	Not Mention in Schedule A & B. But found at site having carriageway width less than 7.5 meter. Hence widening done for 12 meter. It is recommended to consider as a Positive change of scope for widening and slab replacement	
26	96	Extra	60+140	----	-	-	Widening	Slab Culvert	1x2.00x1.0 mtr	Not Mention in Schedule A & B. But found at site having carriageway width less than 7.5 meter.	

									Merge widening done @ 12 mtr. It is	
(3) Hume Pipe Culvert										
									In the schedule B-6-b(a) (ii) page no. 21 serial no. 12 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required as such there was no defined nala /stream at site. Hence the existing structure was retained .Recommended for (-ve) negative change of scope for HPC 1x1200mm.	
28	29	Extra	17+395	-	-	-	New construction	HPC	1 X 1.20mtr	Not Mention in Schedule A & B. But at site culvert was required. There was defined natural stream. It is recommended to consider as a Positive change of scope for HPC 1x1200.	
29	30	Extra	32+115	-	-	-	New construction	HPC	1 X 1.20mtr	At chainage32+115 no structure was proposed but HPC of 1x0.90m. Was found at site in poor condition. Therefore new construction was proposed hence recommended to consider positive change of scope for 1x1.2 HPC	
30	55	43/10	36+585	Retained	SC	1 X 1.50	Reconstruction	HPC	1x1.20 mtr	In the schedule B-6-b(a) (ii) page no. 36 serial no. 05 the SC was proposed to retained but the existing structure was found in Poor condition and reconstruction was required . hence the existing structure was reconstructed as HPC 1x1.20 in place of SC 1x1.50 Recommended for (+ve) positive change of scope for HPC 1x1200mm.	
31	61	Extra	39+917	-	-	-	New Construction	HPC	1 X 1.20mtr	Not Mention in Schedule A & B. There was defined natural stream at site and hence the culvert was required. It is recommended to consider as a Positive change of scope for HPC 1x 1200.	
32	64	Extra	42+379	-	-	-	New construction	HPC	1 X 1.20mtr	Not Mention in Schedule A & B. There was defined natural stream and SC 1x1.0 was found at site hence culvert was required. It is recommended to consider as a Positive change of scope for HPC 1x 1200.	
33	70	Extra	55+453	-	-	-	New construction	HPC	1 X 1.20mtr	Not Mention in Schedule A & B. There was defined natural stream and HPC 1x0.9 was found at site hence HPC and proposed accordingly. Culvert was required. It is recommended to consider as positive change of scope for HPC 1x1.20 mtr.	

										As the schedule B-6-b(a) (ii) page no. 34 serial no. 41 the HPC was proposed for reconstruction but existing structure was found in good condition and reconstruction was not required, hence the existing structure was retained. Recommended for (-ve) negative change of scope for HPC 1x1200mm.
										In the schedule B-6-b(a) (ii) page no. 34 serial no. 42 the HPC was proposed for reconstruction but the existing structure was found in good condition and reconstruction was not required, hence the existing structure was retained. Recommended for (-ve) negative change of scope for HPC 1x1200mm.
36	83	22/2	53+494	Retained	HPC	1 x1.20	Widening	HPC	1 X 1.20mtr	In the schedule B-6-b(a) (ii) page no. 37 serial no. 65 the HPC was retained and the existing structure was found in good condition, having carriageway less than 7.5m hence widening done for 20.50mtr width. It is recommended to consider widening for (+)ve positive change of scope.
37	85	21/10	54+485	Reconstruction	HPC	1x1.20	Widening	HPC	1 X 0.900mtr	In the schedule B-6-b(a) (ii) page no. 34 serial no. 43 the HPC was proposed for reconstruction but the existing structure was found in good condition having carriageway width less than 7.5 meter. Hence widening done for 20.5Mtr. It is recommended to consider as a (-ve) negative for reconstruction of existing structure
38	88	14/8	55+014	Reconstruction	HPC	1 X 1.20	Widening	HPC	1 X 1.00 mtr	In the schedule B-6-b(a) (ii) page no. 34 serial no. 44 the HPC was proposed for reconstruction but the existing structure was found in good condition having carriageway width less than 7.5 meter. Hence widening done for 20.5Mtr. It is recommended to consider as a (-ve) negative for reconstruction of existing structure.
39	91	Extra	56+350	-	-	-	Widening	HPC	1 X 0.90 meter	Not Mention in Schedule A & B, But found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. of scope for widening. It is recommended to consider as a Positive change of scope for widening.
40	98	Extra	61+268	-	-	-	Widening	HPC	1 X 0.90 mtr	Not Mention in Schedule A & B, But found at site having carriageway width less than 7.5 meter. Hence widening done for 12 mtr. It is recommended to consider as a Positive change of scope for widening.

31	99	Extra	62+065	-	-	-	Deleted	HPC	1 X 1.00	Not Mention in Schedule A & B. But found 1x1.00HPC	
										recommended to consider as a Positive change of scope for HPC 1x1200.	
43	100	12/2	64+050	Reconstruction	-	HPC	1x1200-	Deleted	-	-	In the schedule B-6-b(a) (ii) page no. 35 serial no. 46 the HPC was proposed for reconstruction but reconstruction was not required, as such there was no defined nala /stream at site. Recommended for (-ve) negative change of scope for HPC 1x1200).
44	113	Extra	73+254	-	-	-	New Constructio n	HPC	1 X 1.20mtr	Not Mention in Schedule A & B. There was defined natural stream hence at, culvert was required. It is recommended to consider as a Positive change of scope for HPC 1x1200.	

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Annexure 11: Project Photos


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