SHREM FINANCIAL PRIVATE LIMITED

Development of Sardarpur- Badnawar Road Section (SH-35) in the State of Madhya Pradesh on DBFOT (Toll Annuity) Basis

TECHNICAL DUE DILIGENCE REPORT

FEBRUARY, 2021

SUBMITTED BY

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CHAPTER 1. INTRODUCTION

1.1 General

DBL Sardarpur BadnawarTollways Limited (herein after referred to as the "Concessionaire") had augmented the existing road from Km 0+000 to Km 43+300 (43 Kms) on Sardarpur– Badnawar Road section to 2 laning on DBFOT (Design, Build, Finance, Operate and Transfer) in the state of Madhya Pradesh, in accordance with the provisions of the Concession Agreement (CA) executed with Madhya Pradesh Road Development Corporation Limited (herein after referred to as the "MPRDC") on 29th June, 2011.

Project highway starts at Sardarpur (Km.0.000) and ends at Bhelosa Chauraha (Km.43.300) passing through Bola,Bidya, Labaria, Rajod, Nipavali in the state of Madhya Pradesh on Design, Build, Finance, Operate and Transfer (DBFOT) Toll + Annuity basis. Project Location map is given at Fig 1-1.

SHREM ROADWAYS PRIVATE LIMITED (SRPL) acquired DBL Sardarpur Badnawar Tollways Limited vide agreement dated 26 March 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 Carriage way 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.

Table 1.1: The Project Data

S. No.	Particulars	Details
1	Name of the project	Construction, Operation and maintenance from 0+000 to 43+300 on Sardarpur - Badnawar Road section of SH-34 on DBFOT (Design, Build, Finance, Operate and Transfer) on Toll + Annuity Basis.
2	Road Type	State Highway
3	Name of the Authority	Madhya Pradesh Road Development Corporation Limited
4	Name of the Concessionaire	DBL Sardarpur BadnawarTollways Limited
5	Name of the EPC Contractor	Dilip Buildcon Limited
6	Date of LOA	15.04.2011
7	Date of Agreement	29.06.2011
8	Design length as per Schedule B of CA	42.976 Km
9	Actual length constructed	42.976 Km
10	Project lane configuration	2 Lane
11	EPC cost	81.70 Cr
12	Nature of contract	BOT (Toll + Annuity)
13	Toll collected by	Concessionaire
14	Concession period	15 years from the appointed date
15	Date of Letter of Award	15.04.2011
16	Appointed date	16.12.2011
17	Concession end date	15.12.2026
18	Construction period	730 days from the appointed date.
19	Schedule completion date	16.12.2013
20	Date of issuance of provisional certificate (Commercial operation date)	9.06.2012
21	Date of issuance of completion certificate	05.09.2012
22	Annuity amount (every six months)	4.71 Cr
23	Total number of annuities payable	26 No
24	First annuity payment date	09.12.2013
25	Total number of annuity paid	17 No

1.3 Scope of consultancy services

The scope of work includes providing 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 described in the following table to be developed as per schedule B and Schedule C of Concession Agreement (CA) including Change of scope.

Table 2.1: Salient Features

S.No.	Particulars	As per CA	As per COS	As per Site
1	Total Length of 2 Lane with earthen shoulder	38.731 Km	---	38.731 Km
2	Total Length of 2 Lane with Paved shoulder	4.245	---	4.245
3	Reconstruction	32.692 Km	(-)1.450 Km	31.242 Km
4	Realignment/Bypass	10.284 Km	1.450 Km	11.734 Km
5	Toll Plaza	Km 9+250	Change in Location	Km8+600
6	Bus Bays / Bus Shelters	16 Nos.	---	16 Nos.
7	Truck Lay Bays	01 No.	---	01 No.
8	Major Junction	02 Nos.	---	02 Nos.
9	Minor Junctions	12 Nos.	---	12 Nos.
10	Major Bridges Retained	01 No.	---	01 No.
11	Total Minor Bridges	17 Nos.	---	17 Nos.
12	Total Pipe Culverts	22 Nos.	---	22 Nos.
13	Total Slab Culverts	24 Nos.	---	24 Nos.

2.2 Typical Cross Section (TCS) Schedule

The Concessionaire has followed the Typical Cross Sections shown below as per schedule, during the construction.

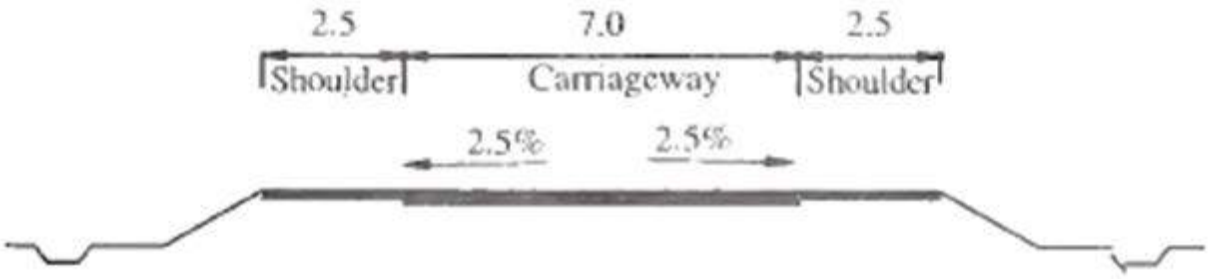

Figure 2.1: (TCS 2.1 of Schedule D of CA) -2 Lane Carriageway

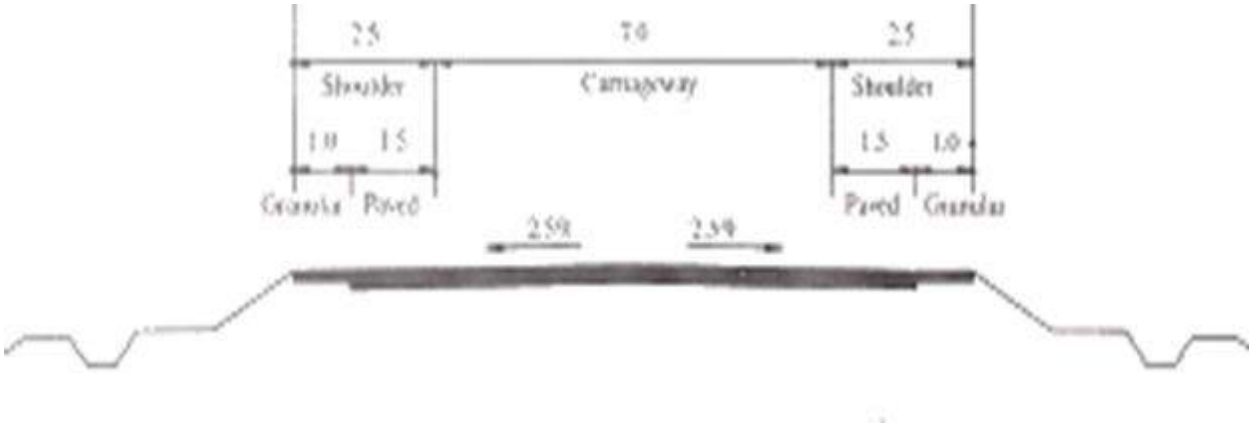

Figure 2.2: (TCS 2.3 of Schedule D) - 2 Lane with Paved Shoulder. (Cross Section in Open Country)

As built drawings are verified and found in accordance with TCS.

TCS schedule is provided below.

Table 2.2: TCS Schedule

S. No	From Chainage (Km)	To Chainage (Km)	Length (m)	Type of TCS
1	0.000	0.200	0.200	TCS.2.3 of Schedule D
2	0.200	6.200	6.000	TCS.2.1 of Schedule D
3	6.200	7.145	0.945	TCS.2.3 of Schedule D
4	7.145	13.100	5.955	TCS.2.1 of Schedule D
5	13.100	13.870	0.770	TCS.2.3 of Schedule D
6	13.870	19.220	5.350	TCS.2.1 of Schedule D
7	19.220	19.620	0.400	TCS.2.3 of Schedule D
8	19.620	24.400	4.780	TCS.2.1 of Schedule D
9	24.400	25.100	0.700	TCS.2.3 of Schedule D
10	25.100	36.440	11.340	TCS.2.1 of Schedule D
11	36.440	36.600	0.160	TCS.2.3 of Schedule D
12	36.600	37.700	1.100	TCS.2.1 of Schedule D
13	37.700	38.200	0.500	TCS.2.3 of Schedule D
14	38.200	39.800	1.600	TCS.2.1 of Schedule D
15	39.800	40.370	0.570	TCS.2.3 of Schedule D
16	40.370	42.976	2.606	TCS.2.1 of Schedule D

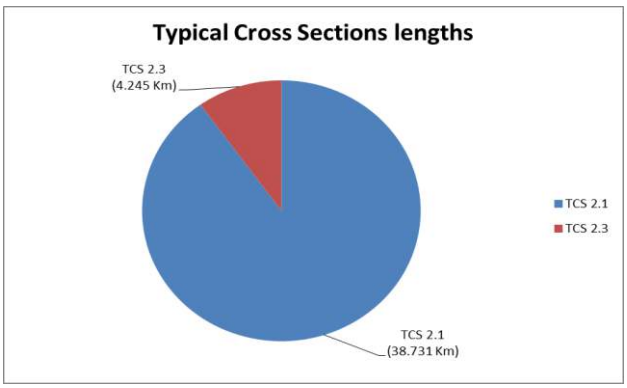

Figure 2.3: Typical Cross Section followed in the Project road

2.3 Road Side Drainage:

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

2.4 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

Realignment of 11.734 Km has been constructed as per Schedule B of the Concession Agreement and COS.

2.6 Intersections

As per provisions of Schedule B of the Concession Agreement 2 Major Junctions and 12 Minor Junctions are provided. Details are given below.

Table 2.3: Summary of Junctions

S. No	Chainage	Side
Major Intersection		
1	0.000	Cross
2	42.976	Cross
Minor Intersection		
1	3.756	LHS
2	6.990	LHS
3	7.280	RHS
4	8.900	RHS
5	10.150	LHS
6	14.300	LHS
7	24.700	RHS
8	29.400	RHS
9	32.000	RHS
10	34.063	Cross
11	35.400	LHS
12	37.600	LHS

2.7 Grade Separated Structures and underpasses

There are no grade-separated structures in the Project, as per provisions of Schedule B of the Concession Agreement.

2.8 Road Under Bridge

There is no RUB in the Project, as per provisions of Schedule B of the Concession Agreement.

2.9 Summary of the Carriageway Details

The details of Pavement are shown in the following table.

Table 2.4: Summary of Carriageway Details

S. No.	Description	Flexible (km)	Rigid (km)	TCS Type
1	2 Lane with earthen shoulder	38.731	---	Fig 2.1 of Schedule D of CA
2	2 Lane with paved shoulder	4.245	---	Fig 2.3 of Schedule D of CA
3	4 Lane	---	---	Fig 2.2 of Schedule D of CA
4	Total length of the project	42.976	---	---
TYPE OF ALIGNMENT				
5	New alignment	---	---	---
6	Realignment	11.734	---	---
7	Strengthening	---	---	---
8	Reconstruction	31.242	---	---
9	Total length of the project	42.976	---	---

2.10 Summary of Structures:

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

Table 2.5: Improvement Proposal of Structures

S. No.	Description	Major Bridges	Minor Bridges	Hume Pipe Culverts	Box/Slab Culverts
1	Retained	1	13	10	---
2	Widening	---	---	5	---
3	Reconstruction	---	04	7	24
4	New	---	---	---	---
5	Improvement	---	---	---	---
6	Total	1	17	22	24

Details of the condition survey carried out on structures are provided at **ANNEXURE-2 & 3**

2.11 Toll Plazas

As per Schedule C of the CA provisions and COS, one Toll Plaza has been constructed at Km. 8+600. Salient features of Toll Plaza are provided below.

- Each side comprises of one normal lane, one extra wide lane and one bike lane.
- The lane width in normal lanes is 3.20mand extra lane is of 4.5 m width.
- Single canopy is provided to cover the toll lanes.
- Toll plaza has been constructed as per standards set forth in Schedule D of CA having facilities like lighting, water supply and firefighting arrangements.

Figure 2.4: Toll Plaza at Km. 8+600

2.12 Bus shelters and truck lay byes

As per the provisions of Schedule C of the CA, 16 Nos. Bus shelters and 1No truck lay bye is provided in the entire length of Project. Details such as Chainage Location and Name of Village are listed in the following table.

Table 2.6: Bus Shelters and Truck Lay Byes details

S. No.	Chainage	Side	Location
Bus Shelters			
1	0.100	LHS	Sardarpur
2	0.300	RHS	Sardarpur
3	6.200	LHS	Bola Village
4	6.400	RHS	Bola Village
5	13.200	LHS	Jalona Village
6	13.500	RHS	Jalona Village
7	19.400	LHS	Bodiya Village
8	19.700	RHS	Bodiya Village
9	24.400	LHS	Labaria Village
10	25.300	RHS	Labaria Village
11	35.000	LHS	Rajad 1village
12	36.500	RHS	Rajad 1village
13	38.300	LHS	Nipavali Village
14	38.550	RHS	Nipavali Village
15	40.000	LHS	Dharsi kheda Village
16	40.600	RHS	Dharsi kheda Village
Truck lay bay			
1	42.600	Cross	Dharsi kheda Village

2.13 Other Project Facilities Provided as per Schedule C of CA

- Roadside furniture: Sign boards, kilometer stones, road marking and object/hazard markers are provided in accordance with IRC-SP: 73-2007.
- Traffic safety devices: W beam crash barriers, parapet walls are provided as per the provisions of Schedule B of the CA
- Landscaping: provided at toll plaza location and being maintained
- Tree plantation: Tree plantation is provided on both sides of the project corridor all along the way and being
- Medical Aid Post: Provided at toll plaza location and is operational
- Highway Lighting: Highway lighting is provided at Toll Plaza and truck lay bay locations and is functional.

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 below.

3.2 Road Inventory

Inventory of the project road was carried out physically and is summarized in the following table. Couple of representative photographs are given below to have a clear picture of the Project.

Table 3.1: Road Inventory

S. No.	Features	Remarks
1	Terrain	Plain, rolling and hilly Terrain
2	Land Use	Built Up 25 %, Agriculture 53%, Hilly 2%and Barren 20%
3	Earthen shoulder	1.0 m to 1.5m Width on site
4	Junctions	14 Nos.
5	Toll Plaza	Km.8+600
6	Sign boards	Sign boards are provided as per requirement
7	Road Markings	Lane markings are provided as per requirement
8	Bus Bays /shelters	16 Nos.
9	Truck Lay bye	1 Nos.
10	Street Lighting	Highway lighting provided as per requirement
11	Tree plantation	Provided

Km. 7+030

Km. 14+400

Figure 3.1: Existing Road Features

3.3 Pavement Condition

Pavement condition survey was carried out on the project road, based on observations supplemented with 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 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 pavementcondition is measured under the following sub-heads:

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

Upon verification of the Pavement condition in the above said manner, it is observed that the Pavement condition of Project road is good. The field measurements of the Pavement Condition survey are

tabulated in the standard proforma as per IRC: SP-19 and is given in ANNEXURE 1. The summary of Pavement condition is given below.

Table 3.3: Pavement condition summary

From (km.)	To (km.)	Length (km.)	Condition
0+000	42+976	42.976	Good

Km. 19+400 **Km. 29+200**

Figure 3.2: Representative Photo of pavement Condition

CHAPTER 4. INVENTORY AND REVIEW OF STRUCTURES

4.1 General Assessment and Condition of the Existing structures

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

4.2 Inventory of Structures

The details of structures along the project highway is described below.

Table 4.1: List of Structures

S. No.	Type of Structure	Numbers
1	Major bridges	1 Nos.
2	Minor Bridge	17 Nos.
3	Pipe culverts	22 Nos.
4	Slab/Box Culverts	24 Nos.

For major bridge superstructure is of RCC Box Girder with RCC wall type piers and abutments resting on well/pile foundations. There are 17 minor bridges in which some are RCC solid slab type bridges, some are precast RCC T-Beam bridges with wall type abutments resting on open foundations. Also there are some RCC box type minor bridges. Detailed inventory and condition survey of bridges are given in **ANNEXURE 2.** The culverts observed along the project road are mainly of two types viz. pipe culverts and RCC slab/box culverts. 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

There is one Major bridge in the project stretch. The total length of the bridge is 99.6m with 4 spans of 24.9m. The superstructure is of RCC Box girder. the substructure is of RCC wall type piers and abutments resting on well/pile foundations. Elastomeric/Neoprene bearings are provided. Expansion joints are of buried type and RCC railing has been provided.

Table 4.2: List of Major Bridges

S. No.	Chainage (Km)	Span	Total Length of Bridge (m)
1	21+878	4 x 24.9	99.60

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

Figure 4.1: Overall view of the major bridge at Km 21+878

4.4 Details of Minor Bridges

The details of Minor bridges in the project highway are listed below. The type of superstructure for minor bridges are RCC solid slab, Precast RCC T-Beam and cast in situ deck slab (5-girder system), RCC Box type structure.

The substructures are of PCC conventional wall type supported with open foundations, RCC wall type with open foundations.

Expansion joints are of Buried type and bearings are Tar Paper and Neoprene bearings. RCC railing and RCC crash barriers are provided on bridge deck.

Table 4.3: Inventory of Minor Bridges

S. No.	Chainage Km.	Span	Total Length of Bridge (m)	Description
1	0+607	2x5.4m.	10.8	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
2	3+650	1x6.2+1x6.9+1x7.2m.	20.3	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
3	4+128	2x4.5m.	10.1	It is twin cell RCC box type minor bridge.
4	6+925	6x8.4m.	50.4	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
5	9+616	2x12.0m.	24.0	The Minor Bridge has RCC solid slab superstructure supported on

S. No.	Chainage Km.	Span	Total Length of Bridge (m)	Description
				conventional RCC/PCC wall type piers and abutments resting on open foundations.
6	10+009	2x5.6m.	11.2	It is twin cell RCC box type minor bridge.
7	11+649	2x3.1m.	6.2	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
8	12+950	2x4.5m.	9.0	It is twin cell RCC box type minor bridge.
9	13+768	1x8.8m.	8.8	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
10	24+339	3x15.6m.	46.8	The Minor Bridge has Precast RCC T-Beam super structure with cast in situ deck slab (5-Girder System), supported on conventional RCC wall type piers and abutments resting on open foundations.
11	25+328	1x9.4m.	9.4	It has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
12	28+100	2x6.4m.	12.8	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
13	29+166	2x5.6m.	11.2	The Minor Bridge has RCC solid slab superstructure supported on conventional masonry wall type piers and abutments resting on open foundations.
14	29+975	3x15.6m.	46.8	The Minor Bridge has Precast RCC T-Beam super structure with cast in situ deck slab (5-Girder System), supported on conventional RCC wall type piers and abutments resting on open foundations.
15	35+193	3x15.6m.	46.8	The Minor Bridge has Precast RCC T-Beam super structure with cast in situ deck slab (5-Girder System), supported on conventional RCC wall type piers and abutments resting on

S. No.	Chainage Km.	Span	Total Length of Bridge (m)	Description
				open foundations.
16	37+900	2x8.4m.	16.8	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.
17	40+488	2x13.1m.	26.2	The Minor Bridge has RCC solid slab superstructure supported on conventional PCC wall type piers and abutments resting on open foundations.

Km. 3+650

Km. 4+128

Km. 6+925

Km. 9+616

Figure 4.2: Representative photos for 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. For some of the pipe culverts vegetation and vent cleaning is required. In general, the condition of all the structures is found satisfactory. The detailed condition of the same are given the following sections. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3.**

4.5.1 General Description of the Slab/Box Culverts

There are 24 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

Sl. No.	Chainage @Km.	Span (m)	Vent Size (m)
1	0+185	1 x 2.4	1.5
2	1+345	1 x 2.4	1.8
3	2+595	1 x 3.0	2
4	3+215	1 x 3.2	1.9
5	5+415	1 x 4.8	2.2
6	7+705	1 x 3.4	2.1
7	9+605	1 x 2.4	2.3
8	11+353	1 x 2.4	2.1
9	11+894	1 x 3.4	1.8
10	12+585	1 x 2.4	2.9
11	13+858	1 x 3.2	1.8
12	14+652	1 x 5.5	1.8
13	15+223	1 x 5.5	4
14	15+967	1 x 3.4	2.2
15	20+813	1 x 2.4	2.1
16	23+052	1 x 2.4	2
17	24+782	1 x 2.4	1.8
18	25+156	1 x 5.4	1.5
19	26+128	1 x 3.4	1.7
20	27+188	1 x 2.4	2.1
21	31+773	1 x 3.4	1.8
22	38+172	1 x 3.4	2.5
23	38+894	1 x 3.4	2.1
24	42+243	1 x 3.4	2.1

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

Km. 1+345

Km. 5+415

Km. 11+353

Km. 15+967

Figure 4.3: Representative photos of Slab Culverts

4.5.2 General Description of the Pipe Culverts

There are 22 Nos 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	Span	S. No.	Chainage	Span
1	1+120	1 x 0.9	12	23+362	1 x 1.2
2	1+330	1 x 0.9	13	23+865	1 x 0.9
3	4+376	1 x 0.9	14	26+218	1 x 0.9
4	4+738	1 x 0.9	15	26+890	1 x 0.9
5	5+832	1 x 1.2	16	28+495	1 x 0.9
6	6+600	1 x 1.2	17	32+598	1 x 0.9
7	8+163	1 x 0.9	18	36+344	1 x 0.9
8	10+875	1 x 1.2	19	37+325	2 x 1.2
9	12+218	1 x 1.2	20	38+562	2 x 1.2
10	13+400	1 x 1.2	21	39+343	2 x 1.2
11	20+015	1 x 1.2	22	42+085	2 x 1.2

The general condition of above pipe culverts is good. Some of the culverts are chocked and needs clearance as some debris/garbage was found in the vents.

Km. 37+325

Km. 42+085

Figure 4.4: Representative photos of Pipe Culverts

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 control the deflections in the sub-grade so that no permanent deflections result, the pavement thickness is so designed that the stresses on the sub-grade soil are kept within its bearing capacity. Loading of bituminous pavement requires the stiffest layers to be placed at the surface with successive weaker layers down to sub-grade.

The project road is already operational and the standards applicable during the design development phase of the project road are taken into account for this review. Therefore, the design of pavement has been validated based on IRC: 37-2001 publication while the current publication is IRC: 37-2018.

Review of Pavement Design

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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	Design Parameters
1	Sub Grade CBR (%)	10%
2	Design Life (Years)	8 years for BT 15 years for Granular
3	Design Traffic (MSA)	5 MSA for BT 10 MSA for Granular
4	Surface course (SDBC)	25 mm
5	Binder course (DBM)	50 mm
6	Base course (WMM)	250 mm
7	Sub Base course (GSB)	200 mm

5.3 Validation of Pavement design:

The new pavement shall be designed in accordance with the IRC:37. “Guidelines for the Design of Flexible Pavements”.

Pavement design validation is carried out 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: Flexible Pavement Design Traffic Validation

FY Year	AADT in Vehicles					CVPD (Veh.)	MSA	CMSA	Year	Remarks
	Car	LCV	BUS	2-AT	MAV					
2014	231	106	45	34	22	207	0.20	0.20	3	Actual
2015	263	99	46	23	18	187	0.18	0.38	4	Actual
2016	312	104	49	26	19	199	0.19	0.57	5	Actual
2017	357	109	44	27	26	207	0.20	0.77	6	Actual
2018	370	129	42	31	33	236	0.23	0.99	7	Actual
2019	373	125	41	32	35	233	0.22	1.21	8	Actual
2020	424	153	50	39	78	319	0.31	1.52	9	Actual
2021	445	160	52	41	82	335	0.32	1.84	10	Projected
2022	467	168	55	43	86	352	0.34	2.18	11	Projected
2023	490	177	58	45	90	369	0.35	2.53	12	Projected
2024	515	186	61	47	95	388	0.37	2.90	13	Projected
2025	541	195	64	49	100	407	0.39	3.29	14	Projected
2026	568	205	67	52	104	428	0.41	3.70	15	Projected

Based on the above actual traffic, estimated MSA at 8 years and 15 years are 1.21 and 3.70 respectively. Traffic considered in pavement design (5MSA for 8 Years and 10MSA for 15 Years) is more than estimated traffic based on above actual traffic. Hence the pavement design adopted is found in order.

5.4 Overlay during operation and maintenance

The pavement has been designed to cater traffic of 5 MSA and 10 MSA for a design life of 8 years for Bituminous layers (up to end of year 2019) and 15 years for granular layers respectively (up to end of year 2026), whereas the actual traffic is 1.21 MSA and 3.7 MSA for 8 years and 15 years 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.

5.5 Maintenance/ Overlay schedule

Periodic Maintenance includes Profile corrective course overlaid with the periodic renewal of the wearing course of SDBC. The detail maintenance schedule is summarized below.

Routine maintenance - Every year
Periodic Renewal for Flexible Pavement – Next Major Maintenance Proposed on or before 2026.

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

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

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

6.2 Road Safety Audit

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

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	Metal 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 safe road for the commuters 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 sign 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.

Km. 0+200 Over head sign

Km. 4+00 Chevron signs on the curve section

Km. 10+600 Village sign

Km. 29+900 Crash barrier at bridge section

Figure 6.1: Representative photos during road safety audit

6.3 Conclusion

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

CHAPTER 7. TOLL PLAZA & HTMS

7.1 General

There is one toll Plaza on the project road at Km. 8+600. Each side comprises of 3 Normal Lanes and 0ne extra wide lane. The third lane on both sides is presently used for Bikes. The lane width in normal lanes was 3.20m. The width of islands provided is 1.8m. The single canopy is provided to cover the toll lanes. . Toll plaza building is G+1 floor building which houses control room, UPS and Pantry.

7.2 Tolling Equipment and Control Room Equipment

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

Table 7.1:List of Equipment at Toll Plaza and Control Room

S. No	Equipment	Quantity
Lane Equipment		
1	TLC	4
2	MONITOR	4
3	PRINTER	4
4	KEYBOARD	4
5	CCTV BOOTH	4
6	INTERCOM-S	4
7	IC CAMERA	4
8	AUDIT CAMERA	4
9	BARRIER	4
10	UFD	4
11	TRAFFIC LIGHT	4
12	OHLS	4
13	HIGHT SENSOR	4
14	TREADLE	4
Control Room		
1	MONITOR	5
2	CPU	6
3	SERVER	1
4	KEYBOARD	3
5	SCANNER	1
6	PRINTER	1
7	LCD WITH REMOTE	1
8	MOUSE	4
9	INTERCOM-S	2
10	NVR	1
11	DVR MPRDC	1
12	4 PORT NETWORKING Switch	1
13	16 Port Networking Switch	1
14	BIOMETRIC MACHINE	1
15	AC	1

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	Make & Model	No.
1	Patrol Vehicle	TVS Bike	1
2	Ambulance	Mahindra Genio	1

Toll plaza & Toll Building

Sign boards at Toll plaza

Figure 7.1: 8+600 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 six 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

FY Year	Car	LCV	Bus	Truck	MAV	Total Traffic
2015	95868	36124	16919	8561	6723	164195
2016	114271	38124	17817	9670	7053	186935
2017	130186	39639	16232	9981	9633	205671
2018	135022	47098	15391	11434	12118	221063
2019	136219	45509	14930	11648	12839	221145
2020	155073	55909	18235	14129	28534	271880
AACGR (%)						10.87%

*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 in the following table.

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

Description	Car	Car(pass)	LCV	Bus	Truck	MAV	Total
In Nos.	103681	2877	48527	16099	14081	28515	213780
Toll Revenue collection in Rs.	2592025	230125	2911620	1978005	2085790	8553585	18351150

The figures shown in Table 8-1 are Real time traffic data on project road for the past six years and the growth rate is calculated to be 10.87%. It is pertinent to note that the figures given in table 8-1 are inclusive of exempted /non tollable traffic.

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%.

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

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	292	133	44	39	78	294	292	199	132	116	352	799	Actual
2021	307	140	46	41	82	308	307	209	139	122	369	839	Projected
2022	322	147	49	43	86	324	322	220	146	128	388	881	Projected
2023	338	154	51	45	90	340	338	231	153	134	407	925	Projected
2024	355	162	54	47	95	357	355	242	161	141	427	971	Projected
2025	373	170	56	49	100	375	373	255	169	148	449	1020	Projected
2026	391	178	59	52	105	394	391	267	177	155	471	1071	Projected
2027	411	187	62	54	110	413	411	281	186	163	495	1124	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
Location	8.600
4 lane length in km	0
2 lane length in km	42.976
Agreement Date	29-06-2011
Appointed Date	16.12.2011
Concession period	15
Commercial operation date	09-06-2012

Particular	Toll plaza
Concession End Date	15-12-2026
Traffic study year	2020
Vehicle Type	**AADT**
Car/Jeep/Van	292
2-axle Bus	133
LCV/LGV	44
2A-Truck	39
MAV (2A-6A)	78
Growth Rate (%)	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 TP @ Km. 8.600	Remarks
2019-20	183.512	Actual
2020-21	197.692	Projected
2021-22	216.612	Projected
2022-23	239.460	Projected
2023-24	261.570	Projected
2024-25	280.199	Projected
2025-26	303.482	Projected
2026-27	231.875	259 Days

CHAPTER 9. OPERATION AND MAINTENANCE

9.1 General

As per Article 17 of the Concession Agreement (CA), the Concessionaire will operate and maintain the Project Highways by itself or through O & M Contractors and comply with specification and standards, and other requirements set forth in the Agreement, Good Industry Practice, Applicable Laws, applicable permits and manufacturer guidelines 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, need (if any) 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 the commencement of the month in which maintenance is to be carried out.

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 Highway 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 Highway;
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 Highway
16 Complying with Safety Requirements in accordance with Article 18.

9.4 Operation of Toll Plaza

One lane in each direction is currently operational 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 Highway

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.

1. Preventive Maintenance
2. Routine Maintenance
3. Periodic Maintenance
4. 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 is given below.

Table 9.1: Schedule and status of for Periodic Maintenance

S No.	Scheduled Major Maintenance	Year	Status at site
1	1st Periodic Maintenance	2019	BC Overlay is done
2	2nd Periodic Maintenance	2026	Planned to execute

9.6 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 Highway 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.

9.7 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 May, 2020. As per Schedule K of the CA, If the value exceeds 3000mm in a KM, the stretch shall be rectified. No stretch exceeded the permissible limit of 3000 mm 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.

9.8 O&M Forecast

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

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

Year	Routine maintenance (In crores)	Incidental maintenance (In crores)	Periodic / Major maintenance	Operational Expenses	Total cost per year
2020	0.177	0.119		0.34	**0.64**
2021	0.182	0.123		0.35	**0.66**
2022	0.187	0.127		0.36	**0.68**
2023	0.192	0.130		0.37	**0.70**
2024	0.199	0.134		0.38	**0.72**
2025	0.205	0.138		0.39	**0.74**
2026	0.211	0.143	6.58	0.41	**7.34**
2027	0.154	0.104		0.30	**0..56**

Total	**1.51**	**1.02**	**6.58**	**2.91**	**12.01**

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 Highway on the Site set forth in Schedule-A and as specified in Schedule-B together with provision of Project Facilities as specified in Schedule-C, and in conformity with the Specifications and Standards set forth in Schedule-D
- operation and maintenance of the Project Highway in accordance with the provisions of Concession Agreement (CA)
- performance and fulfilment of all other obligations of the Concessionaire in accordance with the provisions of this CA 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 CA

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
- 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 Highway upon termination of the CA

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.

10.6 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 that is 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 and after determining the tests on completion successful the Independent engineer shall issue the Completion Certificate in the form set forth in Schedule J of CA. Provisional Completion Certificate given in **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 Complete Certificate, Completion Certificate shall be issued to the Concessionaire. Completion Certificate given in **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 initiating during construction period and consented by the MPRDC. Details are provided 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 Highway
- 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 un authorized use of the Project Highway.
- Protection of environment and provision of equipment and materials
- Complying with safety Requirements in accordance with the provisions of the CA.

10.12 Maintenance Requirements (Clause 17.2)

The Contractor shall procure that at all times during the Operations Period; the Project Highway conforms to the maintenance requirements set forth in Schedule K (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.

10.14 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 the Agreement and the Concessionaire shall be entitled to recover Damages, to be calculated and paid for each day of delay until the breach is cured, at the higher of the following.
- 0.5% (zero decimal five percent) of the Average Daily Fee, and
- 0.1% (zero 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 CA ("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 the sum of Rs 4.71 Crores.

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

Table 10.1: Status of Annuity Payments

S. No.	Particulars	Payment Paid on
1	1st Annuity	1-Jan-13
2	2nd Annuity	18-Jun-13
3	3rd Annuity	17-Dec-13
4	4th Annuity	9-Jun-14
5	5th Annuity	18-Dec-14
6	6th Annuity	17-Jun-15
7	7th Annuity	17-Dec-15
8	8th Annuity	15-Jun-16
9	9th Annuity	17-Dec-16
10	10th Annuity	27-Jun-17
11	11th Annuity	28-Dec-17
12	12th Annuity	19-Jun-18
13	13th Annuity	13-Dec-18
14	14th Annuity	20-Jun-19
15	15th Annuity	10-Dec-19
16	16th Annuity	9-Jun-20
17	17th Annuity	18-Dec-20

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. Insurance copies are provided in **ANNEXURE 9.**

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 Policy
			From	To	
Standard Fire & Special Perils Policy	The Oriental Insurance Co Ltd	171200/11/2021/351	10.1.2021	9.1.2022	Constructed road from 0.00Km to 43.5 Km
EEI	The Oriental Insurance Co Ltd	171200/44/2021/42	8.09.2020	7.09.2021	Electronic Equipment
Fire Industrial All Risk Policy	The Oriental Insurance Co Ltd	171200/11/2021/352	10.1.2021	9.1.2022	Roads and Bridges
Employees Compensation Insurance Policy	HDFC Ergo General Insurance Co Ltd	3114203387855600000	19.5.2020	18.5.2021	Insurance for Road paving, Tarring and Road making of employees of DBL and sub-Contractor engaged in DBL

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

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

12.3 Condition of Structures

General condition of Bridges is good. Major structural defects are not noticed. General 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 from Schedule N of CA, the traffic growth observed is 10.87%, where as 5% growth is considered while evaluating forecast of traffic volumes.

12.5 Project Facilities

Toll Plaza is located at Km.8+600 and is operational. Toll Plaza is operated by ETC Toll collection system and connected by network system monitored in administrative building. Bus bays are in fair condition. Medical Aid posts found functional. Avenue plantation and landscaping at Toll Plaza is provided and being maintained. Highway lighting is provided at toll plaza locations and found functional.

12.6 Road safety

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

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 was carried out in 2019and next MM is scheduled in 2026.

12.8 Epilogue

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

ANNEXURES

Annexure 1: Pavement Condition

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

Chainage (Km.)		Pavement Condition						Riding Quality		Pavement Edge Drop (cm)	Shoulder		Embankment Condition (Good/Fair / Poor)	Road Side Drain		Remarks
From	To	Cracking (%)	Ravelling (%)	Potholing (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***	
0+000	1+000								G		E/P	F	F	LD	F	
1+000	2+000								G		E	F	F	NO	PF	
2+000	3+000								G		E	F	F	ULD	PF	
3+000	4+000								G		E	F	F	ULD	PF	
4+000	5+000								G		E	F	F	ULD	PF	
5+000	6+000	1	2						F		E	F	F	ULD	PF	
6+000	7+000								G		E/P	F	F	LD	F	
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	F	
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		2						G		E	F	F	ULD	PF	

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/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***	
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	F	
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/P	F	F	LD	F	
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	F	F	ULD	PF	
28+000	29+000								G		E	F	F	ULD	PF	
29+000	30+000								G		E	F	F	ULD	PF	
30+000	31+000	1	3						F		E	F	F	ULD	PF	
31+000	32+000								G		E	F	F	ULD	PF	
32+000	33+000								G		E	F	F	ULD	PF	
33+000	34+000								G		E	F	F	ULD	PF	

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/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***	
34+000	35+000								G		E	F	F	ULD	PF	
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		2						G		E	F	F	ULD	PF	
41+000	42+000								G		E	F	F	ULD	PF	
42+000	42+976								G		E	F	F	ULD	PF	

Annexure 2: Condition of structures

S. No	Chainage	Type of Structure	Substructure	Superstructure	Expansion Joint	Approach slabs	Drainage spouts	Wearing coat	Bearings	Quadrant Pitching	Toe wall
1	Km. 21+878	Major Bridge	Good	Good	Good	Good	Fair	Good	Good	Good	Good
2	Km. 0+607	Minor Bridge	Good	Good	Good	Good	Fair	Good	-	Fair	Good
3	Km. 3+650	Minor Bridge	Good	Good	Good	Good	Fair	Good	-	Fair	Good
4	Km. 4+128	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
5	Km.6+925	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
6	Km. 9+616	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
7	Km. 10+009	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
8	Km. 11+649	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
9	Km. 12+950	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
10	Km. 13+768	Major Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
11	Km. 24+339	Minor Bridge	Good	Good	Good	Good	Good	Good	Good	Fair	Good
12	Km. 25+328	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
13	Km. 28+100	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
14	Km. 29+166	Major Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
15	Km. 29+975	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
16	Km. 35+193	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
17	Km. 37+900	Major Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good
18	Km. 40+488	Minor Bridge	Good	Good	Good	Good	Fair	Good	Good	Fair	Good

Annexure 3 : Condition of Box/Slab/ Hume Pipe Culverts

Condition of Box/Slab Culverts

S. No	Chainage	Box/slab	Return wall	Quadrant pitching	Toe wall	Aprons
1	0+185	Good	Fair	Fair	Fair	Fair
2	1+345	Good	Good	Fair	Good	Fair
3	2+595	Good	Good	Fair	Good	Fair
4	3+215	Good	Good	Fair	Fair	Fair
5	5+415	Good	Good	Fair	Fair	Fair
6	7+705	Good	Good	Fair	Fair	Fair
7	9+605	Good	Good	Fair	Good	Fair
8	11+353	Good	Good	Fair	Good	Fair
9	11+894	Good	Good	Fair	Fair	Fair
10	12+585	Good	Good	Fair	Fair	Fair
11	13+858	Good	Good	Fair	Good	Fair
12	14+652	Good	Good	Fair	Good	Fair
13	15+223	Good	Good	Fair	Good	Fair
14	15+967	Good	Good	Fair	Good	Fair
15	20+813	Good	Good	Fair	Good	Fair
16	23+052	Good	Good	Fair	Good	Fair
17	24+782	Good	Good	Fair	Good	Fair
18	25+156	Good	Good	Fair	Good	Fair
19	26+128	Good	Good	Fair	Fair	Fair
20	27+188	Good	Good	Fair	Good	Fair
21	31+773	Good	Good	Fair	Good	Fair
22	38+172	Good	Good	Fair	Fair	Fair
23	38+894	Good	Good	Fair	Fair	Fair
24	42+243	Good	Good	Fair	Fair	Fair

Condition of Hume Pipe Culverts

S. No	Chainage	Hume Pipe	Head wall	Quadrant pitching	Toe wall
1	1+120	Good	Good	Fair	Fair
2	1+330	Good	Good	Fair	Fair
3	4+376	Good	Fair	Fair	Fair
4	4+738	Good	Good	Fair	Fair
5	5+832	Good	Fair	Fair	Fair
6	6+600	Good	Good	Fair	Fair
7	8+163	Good	Fair	Fair	Fair
8	10+875	Good	Fair	Fair	Fair
9	12+218	Good	Good	Fair	Fair
10	13+400	Good	Good	Fair	Fair
11	20+015	Good	Fair	Fair	Fair
12	23+362	Good	Fair	Fair	Fair
13	23+865	Good	Fair	Fair	Fair
14	26+218	Good	Good	Fair	Fair
15	26+890	Good	Good	Fair	Fair
16	28+495	Good	Good	Fair	Fair
17	32+598	Good	Fair	Fair	Fair
18	36+344	Good	Good	Fair	Fair
19	37+325	Good	Good	Fair	Fair
20	38+562	Good	Fair	Fair	Fair
21	39+343	Good	Fair	Fair	Fair
22	42+085	Good	Good	Fair	Fair

Annexure 4: Estimation of Toll Revenue

1. Toll Plaza-I: 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.8+600
Car/Taxi/Van	292
LCV	133
Bus	44
Truck	39
MAV	78

2. Traffic Growth Rates

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• Table-2: Details of Growth rates adopted

Year	Car	LCV	BUS	Truck	MAV
2021-25	5.00	5.00	5.00	5.00	5.00
2025-30	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)

Vehicle Type	Single Trip	Local Pass	Total
Car/Taxi/Van	97%	3%	100%
LCV	100%	0%	100%
Bus	100%	0%	100%
Truck	100%	0%	100%
MAV	100%	0%	100%

4. Toll Rates:

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

Vehicle Type	Toll Fee at Km 8+600
Car/Taxi/Van	25
LCV	60
Bus	125
Truck	150
MAV	300

Toll Plaza Revenue (Km.8+600):

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	2592025	230125	2911620	1978005	2085790	8553585	18351150	183.512	183.512
2020-21	2721626	256733	3057201	2197514	2291683	9244479	19769236	197.692	381.204
2021-22	2857708	269570	3477566	2396135	2483888	10176383	21661249	216.612	597.816
2022-23	3600712	299698	3651444	2609125	2771088	11013977	23946044	239.460	837.277
2023-24	3780747	332166	4128941	2837423	2995220	12082497	26156994	261.570	1098.847
2024-25	3969784	348774	4335388	3082029	3234838	13049097	28019910	280.199	1379.046
2025-26	4168274	385487	4877312	3344001	3490929	14082151	30348153	303.482	1682.527
2026-27	4376687	404761	5121177	3624466	3764542	15385701	23187479	231.875	1914.402

Annexure 5: O&M Costs

Routine Maintenance cost for 1 year

S.No.	Item	Frequency	Unit	No	Frequency per year	Qty.	Rate	Amount	Remarks
1	General Cleaning in Carriageway & Shoulders Rural area	Monthly	Km	42.976	12	4	350	721,997	04 Nos of Labour
2	General Cleaning in Carriageway & Shoulders Urban area	Twice in a month	Km	4.245	24	4	350	142,632	04 Nos of Labour
3	Watering in Median Plants	Once in Week	Km	4.245	52	1	1939	428,015	01 Nos of Labour
6	ROW Cleaning	Half yearly	Km	21.488	2	5	350	75,208	5 Nos of labour per KM (50% of the Project length)
7	Cleaning of Culverts	Half yearly	Nos	46	2	2	650	119,600	3 Nos of Labour along with JCB or Excavator
8	Road Furniture Cleaning	Quarterly	Km	42.976	4	1	350	60,166	02 Nos of Labour
9	Maintenance of Bus shelters	Monthly	Nos	16	6	1	350	33,600	2 Nos/ Bus shelter/month
10	General Cleaning in Building & Facilities	Daily	Nos	2.00	6	15	350	63,000	02 Nos of Labour for 30 days
11	Bridges	Half yearly	Nos	17	2	2	350	23,800	02 Nos of Labour for removal of vegetation/Structure
								1,668,018	
	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	Toll plaza AMC	Yearly	Nos		12	1	5000	60,000	10000/month
								75,000	
1	Ambulance	Monthly	Nos	12		1	10000	10000	(1200000 is the cost of vehicle,

S.No.	Item	Frequency	Unit	No	Frequency per year	Qty.	Rate	Amount	Remarks
									considering 10% Rental per year) including maintenance (1 Ambulance/toll plaza)
2	Consumables for Medical Aid Post and Ambulance	Monthly	Nos	12		1	500	6000	2500 Per month for per set (Per set - Per toll plaza)
3	Consumables for Route Patrolling & Crane	Monthly	Nos	12		1	500	6000	2500 Per month for per set (Per set - Per toll plaza)
								22,000	
								1,765,018.00	

Incidental cost for 1 year

S. No	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks
1	Road marking	Half yearly	Sqm	1	1	1002.77333	516	517,431	10 % of Total Project length on B/S for 1 year
3	Maintenance of Earthen Shoulder	Half yearly	Cum	1	3	644.64	225	435,132	5% of total Shoulder length throughout the project
4	Sign Board	Quarterly	Km	1	1	13	4000	52,000	2.5 % of Total sign boards per half year (considered 500 Nos)
5	MBCB	Monthly	RMT			37.5	2400	90,000	2.5% of Total qty per year - (considered 2400 per number)
6	Milestone (KM Stone/ HM Stone / ROW stone etc.)	Quarterly	Nos	42.976	4	11	2250	99,000	5 % of total stones per year (unable to understand the backup)
	Total amount for 1 Year							1,193,563	

Operational Expenses

S NO	PARTICULARS	Amount
1	Man Power	₹ 2,256,000
2	Fuel for Generator & Vehicles	₹ 696,000
3	Electricity	₹ 330,000
4	Stationary	₹ 10,000
5	Replacement of Electrical Fixtures	₹ 38,733
6	Refurbishment of Toll Plaza Equipment	₹ 75,000
	Total Amount	₹ 3,405,733

Abstract of Major Maintenance

Description	Due date	Base cost	Esc Period	Escallation Rate per Year	Cost of MMR on due date @ 5% Escalation	In crores
Date of Estimation	20-01-2021					
Major Maintenance - Highway	01-04-2026	**5,69,12,865**	5.20	3.0%	**6,57,91,272**	**6.58**
				Total	**₹ 6,57,91,272**	**6.58**

Major Maintenance BOQ

Sl. No.	DESCRIPTION	Unit	1st Cycle			2nd Cycle		
			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 sqm.	Sqm	-	14.00		-	14.00	
2	Providing and laying bituminous concrete using a batch type Hot Mix Plant using crushed aggregates of size (table 500-17), premixed with VG Grade Bitumen and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers, Pneumatic Tyre Rollers to achieve the desired compaction as per Technical specification clause No. 507 and mix design conforming the IRC -111 and IRC 37.	Cum	-	7,480.00		-	7,480.00	
3	Providing and laying Semi dense bituminous concrete using a batch type Hot Mix Plant using crushed aggregates of size	Cum	3,919.59	6,800.00	2,66,53,195	3,919.59	6,800.00	2,66,53,195
4	Providing and laying of Micro surfacing		1,56,783.50	160.00	2,50,85,360	1,56,783.50	160.00	2,50,85,360
5	Repair of joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete)	MTRS	-	250.00		-	250.00	
6	Texturing of Rigid pavement (considering 50% for 7 years)	Sqm	-	130.00		-	130.00	

Sl. No.	DESCRIPTION	Unit	1st Cycle			2nd Cycle		
			QUANTITY	RATE	AMOUNT	QUANTITY	RATE	AMOUNT
	Pavement (Asphalt & Concrete)							
	Total				**5,17,38,555**			**5,17,38,555**
	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	10,027.73	516.00	51,74,310	10,027.73	516.00	51,74,310
3	Road Studs	Nos	-	750.00		-	750.00	
4	Kerb painting		-	250.00		-	250.00	
	Total			-	**51,74,310**		-	**51,74,310**
	Grand Total				**5,69,12,865**			**5,69,12,865**

Annexure 6: Letter of Award

MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LIMITED
(Govt. of M.P. Undertaking)
16-A, Arera Hills, Bhopal - 462 011
Tel.: (O) 0755-2765196, 205, 213, 216 (EPBX) Fax : 91-755-2572643
Website : www.mprdc.nic.in.

No. MPRDC/BOT/S-B/2010/ 437
Bhopal, dated 15 April, 2011

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

Sub: **Regarding, Strengthening, Widening, Maintaining and Operating of Sardarpur-Badnawar Road on BOT (Toll + Annuity)basis**

In response to your Pre-Qualification you have submitted Technical and Financial Bid for development of **Sardarpur-Badnawar 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. 4.71 crores **(Rupees four crores seven 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.

Thanking you,

Yours faithfully

Encl: **Duplicate copy of LoA.**

(Neeraj Vijay
Dy.General Manager

Accepted
27/04/2011
DILIP BUILDCON LIMITED * BHOPAL *

Connecting People Through quality infrastructure

Annexure 7: Provisional Completion Certificate

MSV INTERNATIONAL INC.,
D-7, South City-1, Gurgaon-122001 Haryana, India
Tel. 0091-124-4002603, 04
Fax : 0091-124-4002605
E-mail : info@msvgroup.com

Bhopal Office :
7, Rishi Nagar, Char Imli,
Bhopal (M.P.)
Phone : 0755-2430131

ISO 9001 : 2008
Certified Company

PROVISIONAL CERTIFICATE

1. **Mr. Rajeev k Bidwai** acting as Independent Engineer, under and in accordance with the Concession Agreement Dated 30 July 2011 for development of the Sardarpur-Badnawer-Road section (km 1 to 42.990) of State Highway No. 35 (the " Project Highway") on desigh, build, finance, operate and transfer (DBFOT) on Toll Plus Annuity basis, through DBL Sardarpur Badnawer Tollways Ltd. hereby certify that the Tests specified in Article 14 and Schedule-I of the Agreement have been undertaken to determine compliance of the Project Highway with the provisions of the Agreement.

2. Constructions Works that were found to be incomplete and/ of deficient have been specified in the Punch List appended hereto and the Concessionaire has agreed and accepted that it shall complete and /or rectify all such works in the time and manner set forth in the Agreement .(Some of incomplete works have been delayed as a result of reasons attributable to the MPRDC or due to Force Majeure and the Provisional Certificate cannot be withheld on this account. Though the remaining incomplete to the nature and extent of such incomplete works, it would not be prudent to withhold commercial operation of the Project Highway pending completion thereof.

3. In view of the foregoing , I am satisfied that the Project Highway can be safely and reliably placed in commercial service of the Users thereof and in terms of the Agreement the Project Highway is hereby provisionally declared fit for entry into commercial operation on this the 9 June 2012.

ACCEPTED, SIGNED,SEALED
AND DELIEVERED
For and on behalf of

DBL Sardarpur Badnawar Tollways Ltd. Bhopal

Nitin Shrivastava
DBL Sardarpur Badnawar Tollways Ltd,
E- 5/99, Arera Colony Bhopal (M.P.)

SIGNED, SEALED AND DELIEVERED
for and on behalf of
INDEPENDENT ENGINEER by:

MSV INTERNATIONAL INC BHOPAL

Rajeev K Bidwai
MSV International Inc.
7 Rishi Nager Bhopal (M.P.)

Reg. Office : 11101, NE 60th Street, Kirkland, Washington - 980337528, USA, Telefax : 001-425-488-4442
E-mail : info@msvgroup.com

Annexure 8: Completion Certificate

MSV INTERNATIONAL INC.,
D-7, South City-1, Gurgaon-122001 Haryana, India
Tel. 0091-124-4002603, 04
Fax : 0091-124-4002605
E-mail : info@msvgroup.com

Bhopal Office :
7, Rishi Nagar, Char Imli,
Bhopal (M.P.)
Phone : 0755-2430131

ISO 9001 : 2008
Certified Company

COMPLETION CERTIFICATE

1. I, Rajeev K Bidwai, acting as Independent Engineer, under and in accordance with the Concession Agreement dated July 30, 2011 (the "Agreement"). For Two laning of the Sardarpur-Badnawar section (km 1 to42.990) of state Highway No. 35 (the "Project Highway") on build, operate and transfer (BOT) basis, through (M/s Dilip Buildcon, Bhopal), 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 reliably placed in commercial service of the Users thereof.

2. It is certified that in terms of the aforesaid Agreement, all works forming part of Two-Laning have been completed, and the project Highway is hereby declared fit for entry in to commercial operation on this the 5 day of September 2012.

SIGNED SEALED AND DELIVERED

Authorized Representative
of Independent Engineer

Pushkar Malik
Vice President
MSV International, Inc.
D-7 South City-I
Gurgaon (Haryana)

For and on behalf of
INDEPENDENT ENGINEER by:

Signature
Name : Rajeev K Bidwai
Designation : Team Leaader
Address : 7 Rishi Nagar, Char Imli,
Behind Akshay Hospital
Bhopal (M.P.)

Reg. Office : 11101, NE 60th Street, Kirkland, Washington - 980337528, USA, Telefax : 001-425-488-4442
E-mail : info@msvgroup.com

Annexure 9: Insurance

This Document is Digitally Signed

STANDARD FIRE & SPECIAL PERILS POLICY SCHEDULE

Policy No	: 171200/11/2021/351	**Prev Policy No**	: 171200/11/2020/618
Cover Note No	: -	**Cover Note Dt**	:
Insured's Name	: 103406921 - DBL Sardarpur Badnawar Tollways Ltd. (GSTIN: 23AAECD0368P1ZF)	**Issuing Office**	: 171200 - CSU Vadodara (GSTIN: 24AAACT0627R2ZA)
Address	: Plot no. 5, Inside Govind Narayan Singhpole,Chunabhatti, Kolar Road, Bhopal462016, M.P. BHOPAL 462016	**Address**	: 1st FLOOR, KIRTI TOWER, TILAK ROAD VADODARA GUJARAT 390001
Tel /Fax /Email	: / / 0 / NA	**Tel /Fax /Email**	: 0265-2427075 / 0265-2439854 / 171200@orientalinsurance.co.in

Agent/Broker Details

Dev.Off.Code	:
Agent/Broker	: LC0000000179 (1149)UNISON INSURANCE BROKING SERVICES P LTD
Address Tel/Fax/Email	: 601-602 ,6TH FLOOR AURAM NR VASNA,HP PETROL PUMP MAKARPURA DESAI ROAD VADODARA 390015 GUJARAT INDIA,MOB NO 9898398111 PHONE NO 0265-2343274,BARODA,GUJARAT,390007

Period of Insurance : FROM 00:00 ON 10/01/2021 TO MIDNIGHT OF 09/01/2022

Collection No & Dt : DC_I_IND 3214001319 - 08/01/2021 GST INVOICE NO :2419762939 UIN :0

Gross Premium : 91,615 GST : 16,490 Stamp Duty : .5 Total : 1,08,106

Co Insurance Details :

S.No	Co Insurer Name	Share %
1	CSU Vadodara	60.00
2	BAJAJ ALLIANZ GEN INSURANCE	40.00

RISK DETAILS

1 **Location of the Risk** : Fully Constructed road from 0.0 Km Sardarpur and ends at 45.8 Km Badnawar ¿ Intermediate/ Two laning with paved shoulder of Sardarpur- Badnawar on BOT (TOLL+Annuity) basis under State Govt. of Madhya Pradesh

MADHYA PRADESH
DHAR
454111
DHAR

Risk Description : Roads

Place :
Date : 08/01/2021

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 39209485.

Authorised Signatory

CIN: U66010DL1947GOI007158 All the Amounts mentioned in this policy are in Indian Rupee Page 1 of 3

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 171200/11/2021/351

Block Description : 1		
SMI Desc	Nature of Stock	Sum Insured
Toll Plaza Building and its assets & Toll Booths, TMS, HTMS, Office & IT Equipment, Road Furniture, Fixtures, Electrical Poles, Lighting & Fittings, Signboard, Safety Barrier, concrete barrier, protection barrier(Full desc as per Annexure)		9,17,97,062

Cover Wise Details : Cover Name	Sum Insured	Premium
STFI Cover	9,17,97,062	32,129.97
Fire Basic Cover	9,17,97,062	50,488.00
Earth Quake Cover	9,17,97,062	4,590.00
Impact Damage Due To Insured's Own Rail/Road Vehicles, Fork Lifts, Cranes, Blackare And The Like And Articles Dropped Therefrom	9,17,97,062	4,405.00

SCHEDULE OF PREMIUM

TOTAL PREMIUM	91,613.00
ADD :IGST	16,490.00
STAMP DUTY	0.50
TOTAL AMOUNT	1,08,103.00

Total Sum Insured In Words : Indian Rupees Nine Crores Seventeen Lakhs Ninety-Seven Thousand Sixty-Two Only

Total Premium In Words : Indian Rupees One Lakh Eight Thousand One Hundred Three Only

Excess / Deductible :
The following minimum deductibles are applicable based on per Location Sum Insured of the policy.
(except dwelling with individual owners)

Sum Insured Band per Location (including endorsements, if any)	Malicious Damage	
	% Of Claim	Subject to Minimum deductible in INR.
Upto 10 Cr	5	10,000.00
Above 10 Cr and upto 100 Cr	5	25,000.00
Above 100 Cr and upto 1500 Cr	5	500,000.00
Above 1500 Cr and upto 2500 Cr	5	2,500,000.00
Above 2500 Cr	5	5,000,000.00

Place :
Date : 09/01/2021

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 3

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

FIRE INDUSTRIAL ALL RISK POLICY SCHEDULE

Policy No	: 171200/11/2021/352	Prev Policy No	: 171200/11/2020/517
Cover Note No	:	Cover Note Dt	:
Insured's Name	: 103409621 - DBL Sardarpur Badnawar Tollways Ltd. (GSTIN: 23AAECD0366P1ZF)	Issuing Office	: 171200 - CBU Vadodara (GSTIN: 24AAACT0527R2Z4)
Address	: Plot no. 5, Inside Govind Narayan Singhgate,Chunabhatti, Kolar Road, Bhopal462016, M.P. BHOPAL 462016	Address	: Ist FLOOR, KIRTI TOWER, TILAK ROAD VADODARA GUJARAT 390001
Tel /Fax /Email	: / / 0 / NA	Tel /Fax /Email	: 0265-2427075 / 0265-2436664 / 171200@orientalinsurance.co.in
Dev.Officer	:	BROKER	: LC0000000179 (1149)UNISON INSURANCE BROKING SERVICES P LTD

Period of Insurance: FROM 00:00 ON 16/01/2021 TO MIDNIGHT OF 15/01/2022

Collection No & Dt : DC_I_IND 5214001919 - 09/01/2021 GST INVOICE NO :2419762722 UIN :0

Gross Premium : 11,51,102 GST : 2,07,196 Stamp Duty : .5 Total : 13,58,800

Co Insurance Details :

S.No	Co Insurer Name	Share %
1	CBU Vadodara	60.00
2	BAJAJ ALLIANZ GEN INSURANCE	40.00

SECTION I : IAR - STANDARD FIRE AND SPECIALS PERILS SECTION

Location of the Risk : ROADS AND BRIDGES
Fully Constructed road from 0.0 Km Sardarpur and ends at 43.5 Km Badnavar ¿ Intermediate/ Two laning
with paved shoulder of Sardarpur- Badnawar on BOT (TOLL+Annuity) basis under State Govt. of Madhya Pradesh

Deductible :

Risk Description : Roads

Block Description : 1

SMI Description	Nature of Stock	Sum Insured
Roads Incl Service Road, Structures, Bridges (Major, Minor, Railway, River Incl all Other Bridges)Underpasses, Culverts, drainages, Utilities, Slabs Box, Causeways, Machineries Such as DG Sets(Full desc As per annexure)		120,81,02,938

Cover Wise Details	Sum Insured	Premium

Place :
Date : 09/01/2021

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 6485 and 011 35209485.

Authorised Signatory

CIN: U66010DL1947GOI007158 All the Amounts mentioned in this policy are in Indian Rupees Page 1 of 4

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Attached to and forming part of policy number 171200/11/2021/302

Cover Wise Details	Sum Insured	Premium
Fire Basic Cover	120,61,02,938	8,64,458.62
STFI Cover	120,61,02,938	4,22,536.03
Earth Quake	120,61,02,938	80,405.15

SECTION III : IAR-BREAKDOWN SECTION

Item Description	Identification No.	Year of Make
AS PER LIST		

SNI Description	Sum Insured
Machinery Sum Insured	1,00,00,000

Cover Wise Details	Sum Insured	Premium
Breakdown Cover	1,00,00,000	2,500.00

SECTION II : IAR-FLOP SECTION

Type of Industry	: CONTINUOUS INDUSTRY	Basis of Indemnity	: TURNOVER BASIS
Indemnity Period	: 12 Months	Annual Gross Profit	: 1000000
Total Sum Insured	: 10,00,000	Time Exclusion	:

Cover Wise Details	Sum Insured	Premium
Fire LOP-Basic Cover	10,00,000	904.00

SCHEDULE OF PREMIUM

Fire Basic Cover	8,64,458.62
ADD :STFI Cover	4,22,536.03
ADD :Earth Quake	80,405.15
Fire LOP-Basic Cover	904.00
Breakdown Cover	2,500.00
TOTAL PREMIUM	11,51,102.00
ADD :IGST	2,07,198.00
STAMP DUTY	0.00
TOTAL AMOUNT	13,58,300.00

Sum Insured in Words :
Machinery Damage : Indian Rupees One Hundred Twenty Crores Eighty-One Lakhs Two Thousand Nine Hundred Thirty-Eight Only (This Sum Insured Includes Machinery Breakdown Sum Insured Indian Rupees Only)

Place :
Date : 08/01/2021

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 6485 and 011 35209485.

Authorised Signatory

CIN: U66010DL1947GOI007158 All the Amounts mentioned in this policy are in Indian Rupees

This Document is Digitally Signed
Signer: ATUL JERATH
Date: Fri, Nov 6, 2020 12:32:02 IST
Location: NOIDA
Reason: Signing Policy for OICL

ELECTRONIC EQUIPMENT INSURANCE POLICY SCHEDULE

Policy No	: **171200/44/2021/42**	**Prev Policy No**	:
Cover Note No	: ER1700203532	Cover Note Dt	: 08/09/2020
Insured's Code	: 103409921	Issuing Office Code	: 171200
Insured's Name	: DBL Sardarpur Badnawar Tollways Ltd. (GSTIN: 23AAECD0386P1ZF)	Issuing Office Name	: CBU Vadodara (GSTIN: 24AAACT06
Address	: Plot no. 5, Inside Govind Narayan Singhgate,Chunabhatti, Kolar Road, Bhopal462016, M.P. BHOPAL 462016	Address	: Ist FLOOR, KIRTI TOWER, TILAK ROAD VADODARA GUJARAT 390001
Tel /Fax /Email	: / / 0 / NA	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 3214000850 - 17/09/2020 GST INVOICE NO :2419487428 UIN :0

Gross Premium : 1,990 GST : 358 Stamp Duty : 1 Total : 2,348

RISK DETAILS

Section I : EEI - EQUIPMENT

Sum Insured : 44,21,979

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

MADHYA PRADESH - 454001

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		44,21,979

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 : 17/09/2020

For and on behalf of
The Oriental Insurance Company Limited

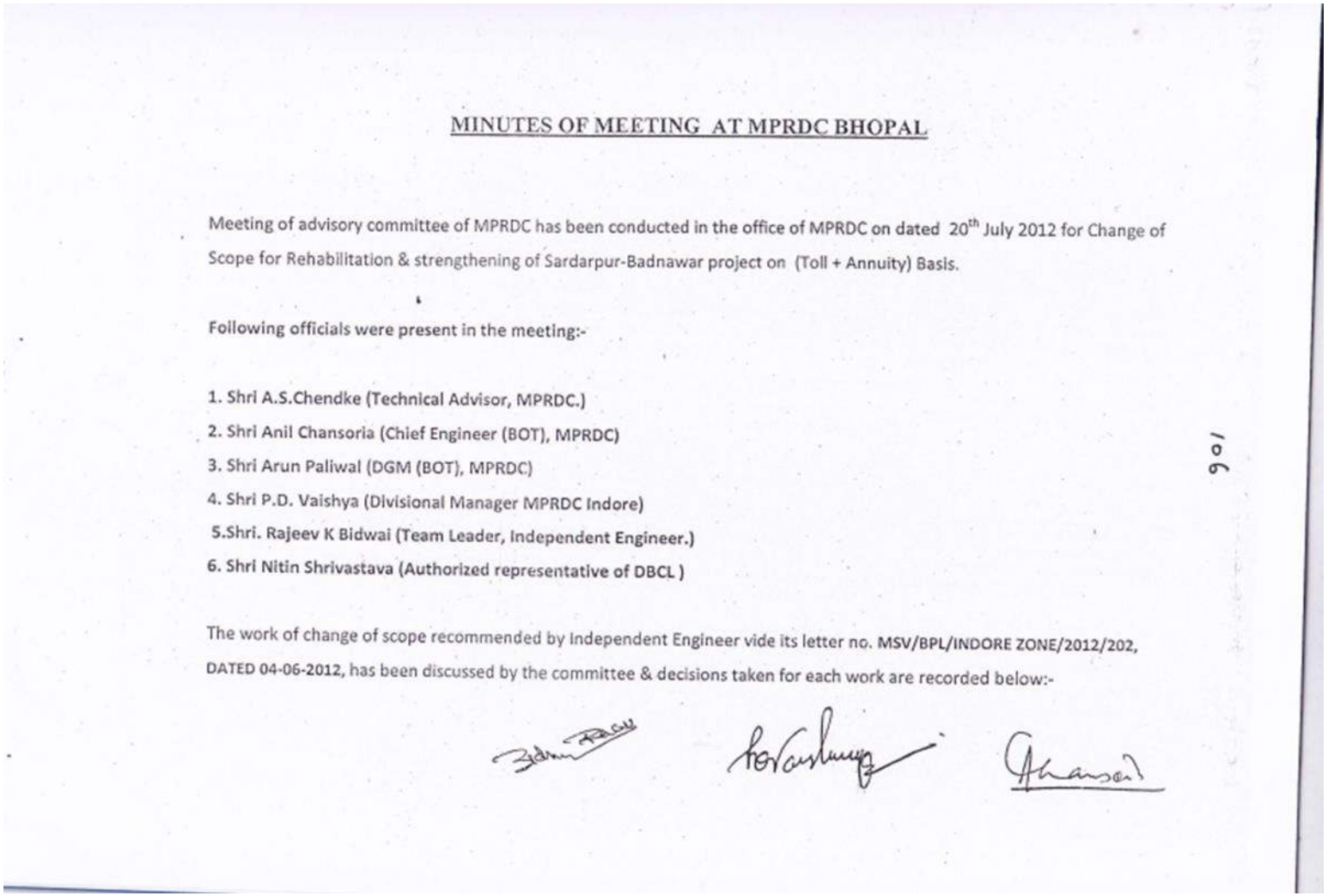
This is an electronically generated document (Policy Schedule).The Policy document duly stamped will be sent by post.

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

Annexure 10: Change of Scope



MINUTES OF MEETING AT MPRDC BHOPAL

Meeting of advisory committee of MPRDC has been conducted in the office of MPRDC on dated 20th July 2012 for Change of Scope for Rehabilitation & strengthening of Sardarpur-Badnawar project on (Toll + Annuity) Basis.

Following officials were present in the meeting:-

1. Shri A.S.Chendke (Technical Advisor, MPRDC.)
2. Shri Anil Chansoria (Chief Engineer (BOT), MPRDC)
3. Shri Arun Paliwal (DGM (BOT), MPRDC)
4. Shri P.D. Vaishya (Divisional Manager MPRDC Indore)
5. Shri. Rajeev K Bidwai (Team Leader, Independent Engineer.)
6. Shri Nitin Shrivastava (Authorized representative of DBCL)

The work of change of scope recommended by Independent Engineer vide its letter no. MSV/BPL/INDORE ZONE/2012/202, DATED 04-06-2012, has been discussed by the committee & decisions taken for each work are recorded below:-

S. NO.	Chainage	Existing details	Provision as per schedule 'B'	Reasons & Recommendation of Independent Engineer	Decision of Committee
1	4+125	Existing Chainage 4+125, Minor bridge with Solid Slab (2x 6.8 m) span, Total Outer width of Bridge 8.3 m.	Widening repair & strengthening of minor bridge up to 12 m.	(i) Reinforcement fully rusted and bond with concrete of slab is very weak. Concrete is porous and disintegrated simply touching by hand. (ii) Abutment & piers of this minor bridge is made from stone masonry its condition is poor holes & plants have seen at many places in wall. (iii) Stone Masonry Foundation was damaged. (iv)Structure is very weak ,So recommended for Reconstruction with span of 10 m.and 12 m width bridge in place of widening is completed . There will be positive change of scope of reconstruction 10 m, span & 12 m. width and widening of existing structure will be negative variation.	Committee is agree with the comments of IE and recommended for reconstruction (with 10 m. span & 12 m. width) under positive change of scope & negative variation for widening of existing structure. **Net valuation of –ve & +ve variation may be worked out by IE.**
2	7+000	Existing Chainage 7+000,Minor bridge with Solid Slab (6x 8.50 m) span, Total Outer width of Bridge 8.3 m	Widening of minor bridge repair & strengthening upto 12 m.	(i) Reinforcement fully rusted and bond with concrete of slab is very weak. Concrete of super structure is porous and disintegrated simply touching by hand. (ii) Stone masonry was having open joints so widening of structure with jacketing of existing this work is done as per scope of work hence no change of scope. (iii) widening has been done as per scope of work (iv) It is recommended to replace super structure slab of 8.3 m. width under +ve change of scope.	Committee is agree with the comments of IE and recommended for replacement of, super structure slab of 8.3 m. wide under +ve change of scope. **Net valuation of –ve & +ve variation may be worked out by IE.**

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5	12+950	Existing Chainage 12+950,Minor bridge with Solid Slab (1x 8 m) span, Totle Outer width of Bridge 8.3 m	Widening repair & strengthening of minor bridge upto 12 m.	(i) Reinforcement fully rusted and bond with concrete of slab is very weak. Concrete is porous and disintegrated simply touching by hand. (ii) Abutment & piers of this minor bridge is made from stone masonry its condition is poor holes & plants have seen at many places in wall. (iii) Stone Masonry Foundation was damaged. (iv)Structure is very weak ,So recommended for Reconstruction with span of 10 m.& to 12 m wide bridge in place of widening. There will be positive change of scope of reconstruction 10 m, span & 12 mwidth. widening of existing structure will be negative variation.	Committee is agree with the comments of IE and recommended for reconstruction (with 1 X 10 m. span & 12 m. width) under positive change of Scope & negative variation for widening of existing structure. **Net valuation of –ve & +ve variation may be worked out by IE.**
6	35+225	Existing Chainage 35+225,Minor bridge with Solid Slab (6x 8.60 m) span, Totle Outer width of Bridge 8.3 m	Widening repair & strengthening of minor bridge upto 12 m.	(i) Reinforcement fully rusted and bond with concrete of slab is very weak. Concrete is porous and disintegrated simply touching by hand. (ii) Abutment & piers of this minor bridge is made from stone masonry its condition is poor holes & plants have seen at many places in wall. (iii) Stone Masonry Foundation was damaged. (iv)Structure is very weak ,So recommended for Reconstruction with span of 3 X15.67 m. & with increase in the height of bridge 12 m. wide bridge in place of widening. There will be positive change of scope of reconstruction 3 X 15.67 m, span & 12 m width. widening of existing structure will be negative variation.	Committee is agree with the comments of IE and recommended for reconstruction (with 3 X 15.67 m. span & 12 m. width)under positive change of Scope & negative variation for widening of existing structure. **Net valuation of –ve & +ve variation may be worked out by IE.**
7	35+200 to 36+650	Single lane road is existing through Rajod town is a length 1.6 km.	Realignment of Rajod town of 7.0 m. width	It was decided in the review meeting at MPRDC's office at Bhopal to construct two lane road in town section of Rajod . Reconstruction of existing single lane road to two lane is recommended under change of scope .	Committee is agreeing with the Proposal and recommended for reconstruction of existing single lane road to two lane road under change of scope under positive change of variation. **Net valuation of –ve & +ve variation may be worked out by IE.**

3	9+616	Existing Chainage 9+616 ,Minor bridge with Solid Slab (3x 7.30 m) span, Total Outer width of Bridge 8.3 m	Widening repair & strengthening of minor bridge upto 12 m.	(i) Reinforcement fully rusted and bond with concrete is porous and disintegrated simply touching by hand. (ii) Abutments & piers of this minor bridge was made from stone masonry its condition is poor. (iii) Stone Masonry Foundation was damaged. (iv) In all structure is very weak. So recommended for reconstruction of 2 X 12 m. span bridge width 12 m. There will be positive change of scope of reconstruction 2 X 12 m, span &12 m width .widening of existing structure will be negative variation.	Committee is agree with the comments of IE and recommended for reconstruction (with 2 X 12 m. span & 12 m. width) under positive change of scope. & negative variation for widening of existing structure. **Net valuation of –ve & +ve variation may be worked out by IE.**
4	10+003	Existing Chainage 10+003,Minor bridge with Solid Slab (2x 7.30 m) span, Totle Outer width of Bridge 8.3 m	Widening repair & strengthening of minor bridge upto 12 m.	(i) Reinforcement fully rusted and bond with concrete of slab is very weak. Concrete is porous and disintegrated simply touching by hand. (ii) Abutment & piers of this minor bridge is made from stone masonry its condition is poor holes & plants have seen at many places in wall. (iii) Stone Masonry Foundation was damaged. (iv)Structure is very weak ,So recommended for Reconstruction with span of 12 m. & width 12 m.to 12 m wide bridge in place of widening. There will be positive change of scope of reconstruction 12 m, span & 12 m. Width and widening of existing structure will be negative variation.	Committee is agree with the comments of IE and recommended for reconstruction (with 1 X 12 m. span & 12 m width)under positive change of scope& negative variation for widening of existing structure. **Net valuation of –ve & +ve variation may be worked out by IE.**

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In- Principle approval under change of scope is recommended for above works as per remark of last column. Further, it has been instructed to Independent Engineer and Concessionaire to prepare complete as built drawings & financial implication and submit within 15 days time positively.

Shri Nitin Shrivastav (Authorized representive Of DBCL)	Shri. Rajeev K Bidwai (Team Leader) Independent Engineer	Shri P.D.Vaishya Divisional Manager (MPRDC) Indore	Shri Arun Paliwal (DGM (BOT), (BOT), MPRDC)	Shri Anil Chansoria (Chief Engineer) MPRDC Bhopal	Shri A.S.Chendke (Technical Advisor) MPRDC Bhopal