



SHREM FINANCIAL PRIVATE LIMITED

**Development of Silwani – Sultanganj – Jaisinghnagar –
Sagar Road (SH-15) in the State of Madhya Pradesh on BOT
(Toll+Annuity) Basis**

TECHNICAL DUE DILIGENCE REPORT



FEBRUARY, 2021

SUBMITTED BY



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Development of Silwani – Sultanganj – Jaisinghnagar – Sagar Road (SH-15) in the State of Madhya Pradesh on BOT (Toll Annuity) Basis

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CHAPTER 1. INTRODUCTION

1.1 General

DBL SILWANI SULTANGANJ TOLLWAYS LIMITED (herein after referred to as the “Concessionaire”) had augmented the existing two-lane road “Silwani – Sultanganj – Jaisinghnagar - Sagar” (SH-15) 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 “MPRDCL”) on 8th September, 2011.

Project road starts at Km. 0+000 located at Silwani (Gairatganj – Bareilly - Udaipura Junction) and ends at Km. 75+995, beyond Mainpani Village at Sagar Road Junction on SH-15. It is situated in central part of Madhya Pradesh and passes through settlements namely, Silwani, Sultanganj, Jaisinghnagar and Sagar Road. Project location map is provided at **Figure 1.1**.

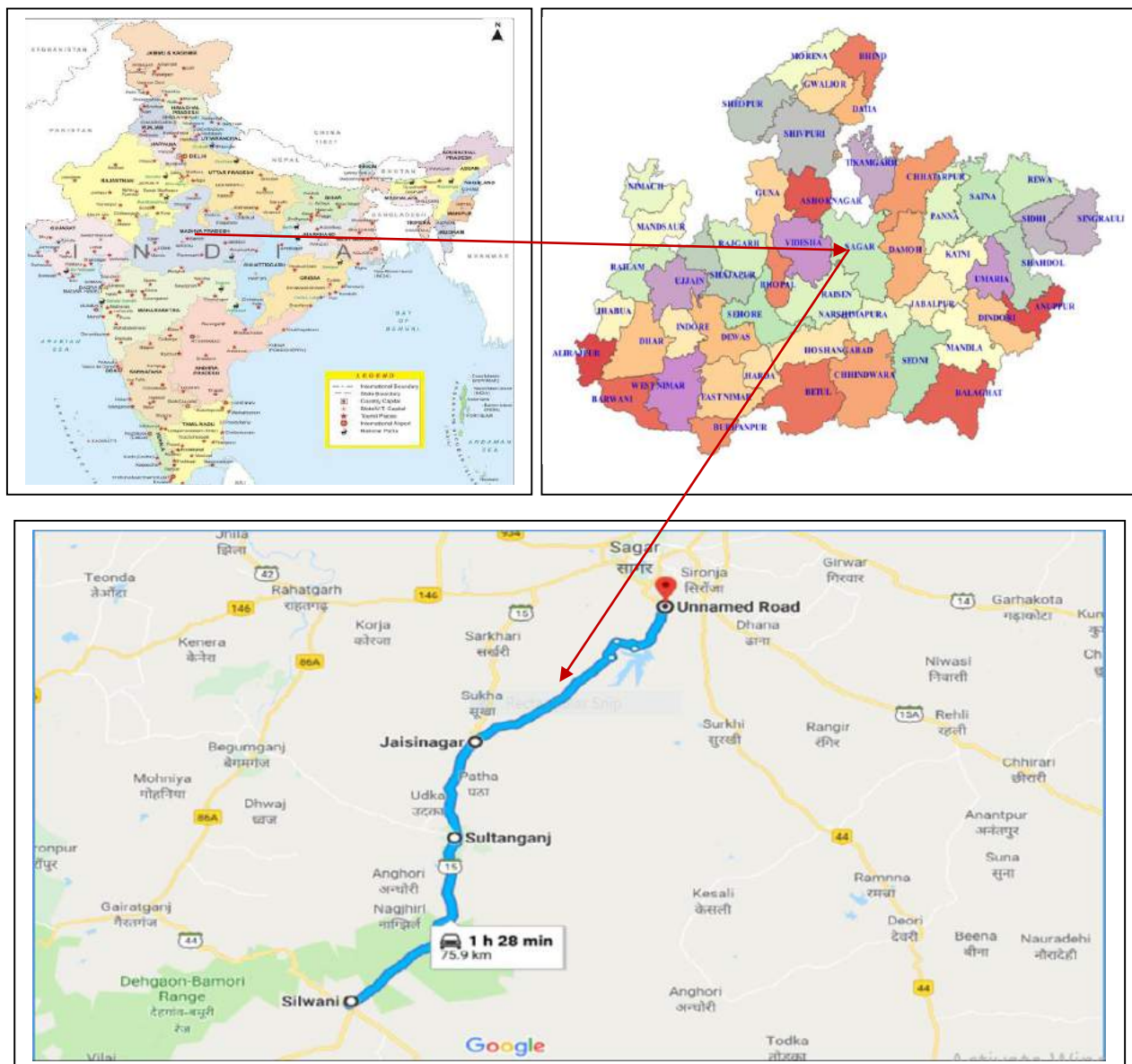


Figure 1.1: Project Location Map

SHREM ROADWAYS PRIVATE LIMITED (SRPL) acquired DBL SILWANI SULTANGANJ TOLLWAYS LIMITED vide agreement dated 26th March 2018.

SHREM FINANCIAL PRIVATE LIMITED (SFPL) appointed RUKY Projects Pvt. Ltd. as consultant for detailed Technical Due Diligence services of the above Road Project to know-how the present condition of Carriageway and Structures, probable costs of Operations and Maintenance during balance Concession period, additional road safety requirements if any and to review the traffic potential and to estimate the projected Toll Collection etc.

1.2 The Project Data

Table 1.1: Project Data

S No.	Particulars	Details
1	Name of the project	Construction of Two Lanning of Silwani – Sultanganj – Jaisinghnagar - Sagar Road (SH-15) for development, maintenance and management on design, build, finance, operate and transfer (DBFOT) on Toll + Annuity Basis in the State of Madhya Pradesh.
2	Road Type	State Highway
3	Name of the Authority	Madhya Pradesh Road Development Corporation Limited
3	Name of the Concessionaire	DBL Silwani Sultanganj Tollways Limited
4	Name of the EPC Contractor	Dilip Buildcon Limited
5	Date of LOA	27.07.2011
6	Date of Agreement	08.09.2011
7	Design Length as per Schedule B of CA	75.995 Km
8	Actual Length Constructed	75.995 Km
9	Project Lane Configuration	Two Lane
10	EPC Cost	115.76 Cr
11	Nature of contract	Toll + Annuity
12	Toll collected by	The Concessionaire
13	Concession Period	15 years from the Appointed Date
14	Appointed date	27.02.2012
15	Concession end date	26.02.2027
16	Construction Period	730 days from the Appointed Date
17	Schedule Completion Date	25.02.2014
18	Date of issuance of Provisional Certificate (Commercial Operation Date)	Section-1: 30.11.2012 Section-2: 25.03.2013
19	Date of issuance of Completion Certificate	Section-1: 28.02.2013 Section-2: 29.05.2013
20	Annuity Amount (every six months)	9.49 Cr.
21	Total Number of Annuities payable	26 Nos.
22	First Annuity Payment Date	25.09.2013
23	Total Number of Annuity Payments paid	15 Nos.

1.3 Scope of Consultancy Services

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

- Review of various contractual documents
- 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 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 of the Project as per schedule B and Schedule C of Concession Agreement (CA) including Change of scope are listed in the following Table.

Table 2.1: Salient Features

S. No.	Particulars	As per CA	As per COS	As per Site
1	Total Length (Flexible)	75.995 Kms.	-	75.995 Kms.
2	Two lanes with Paved Shoulder	3.700 Kms.	-	3.700 Kms.
3	Two lanes with Granular Shoulder	72.295 Kms.	-	72.295 Kms.
4	Reconstruction	75.995 Kms.	-	75.995 Kms.
5	Realignment/Bypass	Nil	-	Nil
6	Toll Plaza	02 Nos.	-	02 Nos.
7	Bus Bays / Bus Shelters	6 Nos.		6 Nos.
8	Truck Lay Bays	Nil		Nil
9	Major Junction	03 Nos.		3 Nos.
10	Minor Junctions	15 Nos.		15 Nos.
11	ROB	Nil		Nil
12	Level Crossing	Nil		Nil
13	Major Bridges	01 No		01 No
14	Minor Bridges	09 Nos.	-1 Nos.	17* Nos.
15	Box/ Slab Culverts	20 Nos.	-3+2 Nos	11* Nos.
16	Pipe Culverts	119Nos.	+13 No -2 No	134*Nos.

* 9 Nos. MNB, 4Nos.HPC are constructed as per site requirement. 8Nos. Box culverts were not constructed on site as they are not required as per site.

2.2 Typical Cross Section (TCS) Schedule

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

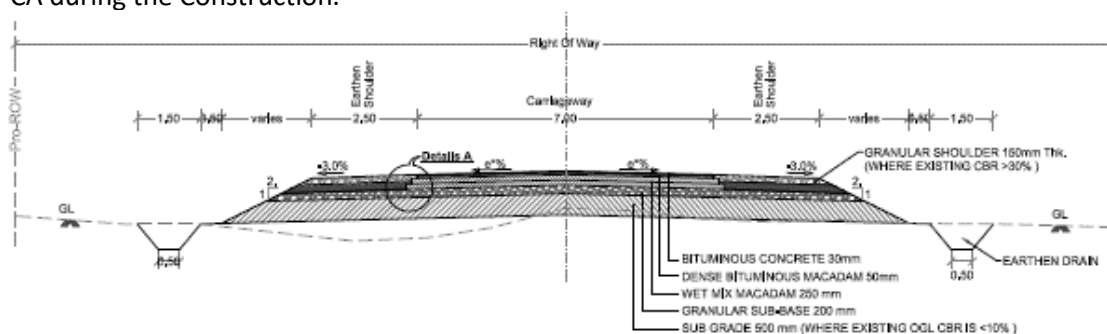


Figure 2.1: TCS-2.1 Open country intermediate lane Carriageway (With Hard Shoulder)

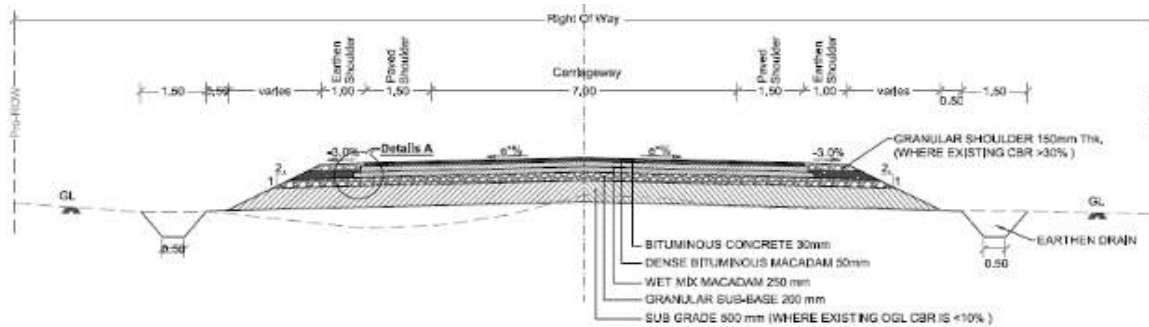


Figure 2.2: TCS-2.2 Built up Area- 2 lane Carriageway (With Paved Shoulder)

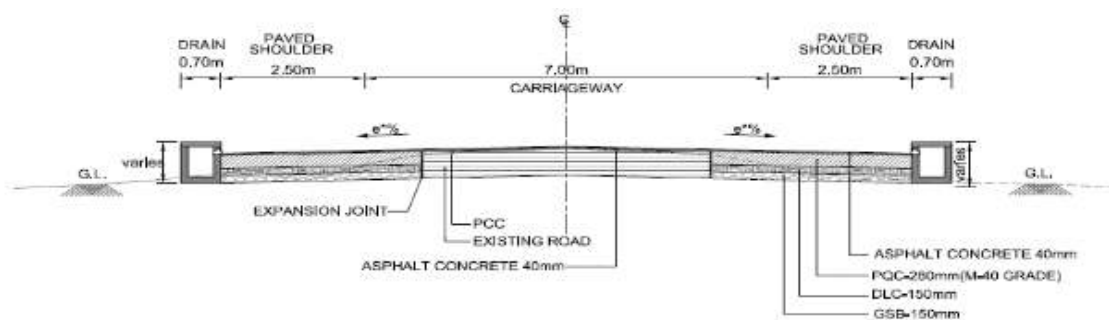


Figure 2.3: TCS-2.3 Built up Area 2-Lane Carriageway with Paved Shoulder (Concentric Widening)

TCS Schedule is provided below.

Table 2.2: TCS Schedule

S. No.	From Chainage (Km.)	To Chainage (Km.)	Length (Kms.)	Type of TCS
1	0+000	0+263	0.263	TCS 2.3
2	0+263	0+600	0.337	TCS 2.2
3	0+600	16+700	16.100	TCS 2.1
4	16+700	17+700	1.000	TCS 2.2
5	17+700	29+700	12.000	TCS 2.1
6	29+700	29+800	0.100	TCS 2.2
7	29+800	45+200	15.400	TCS 2.1
8	45+200	45+900	0.700	TCS 2.2
9	45+900	72+100	26.200	TCS 2.1
10	72+100	72+900	0.800	TCS 2.2
11	72+900	74+800	1.900	TCS 2.1
12	74+800	75+300	0.500	TCS 2.2
13	75+300	75+995	0.695	TCS 2.1

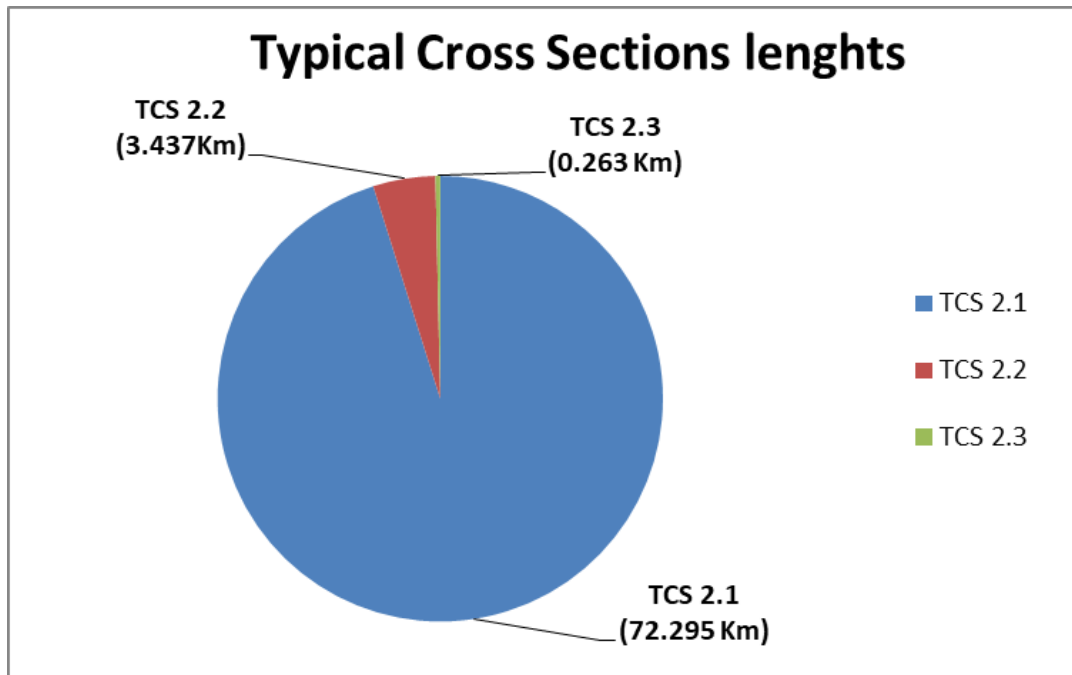


Figure 2.4: Pictorial Diagram of TCS Lengths.

2.3 Road Side Drainage

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

2.4 Service Roads

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

2.5 Bypass/Realignment

There is no bypass / realignment proposed on the project road as per provisions of Schedule B of CA.

2.6 Intersections

As per provisions of Schedule B of CA, 3 Major Junctions and 15 Minor Junctions are provided. Details are given below.

Table 2.3: List of Junctions

S. No.	Chainage (Km.)	Type of Junction	Side	Major/ Minor
1	0+000	X	BHS	Major
2	17+900	T	RHS	Minor
3	21+100	T	RHS	Minor

S. No.	Chainage (Km.)	Type of Junction	Side	Major/ Minor
4	22+300	Y	RHS	Minor
5	24+000	Y	RHS	Minor
6	24+700	T	LHS	Minor
7	28+200	Y	RHS	Minor
8	29+800	X	BHS	Major
9	33+200	Y	LHS	Minor
10	44+100	X	BHS	Minor
11	46+200	X	BHS	Minor
12	46+900	Y	LHS	Minor
13	54+800	T	LHS	Minor
14	57+200	T	LHS	Minor
15	59+000	T	RHS	Minor
16	62+200	X	BHS	Minor
17	66+000	T	RHS	Minor
18	75+010	X	BHS	Major

2.7 Grade Separated Structures and underpasses

Grade Separated Structures and underpasses are not proposed as per provisions of Schedule B of CA.

2.8 Road Over Bridge (ROB)

ROB is not proposed in the project road as per provisions of Schedule B of CA.

2.9 Carriageway and pavement Details

Summary of Carriageway Details is given below:

Table 2.4: Summary of Carriageway and pavement Details

S No.	Description	Flexible (Kms.)	Rigid (Kms.)	Remarks
1	2 Lane with Earthen shoulder	72.295		Fig 2.1 of Schedule D of CA
2	2 Lane with Paved shoulder	3.700		Fig 2.2 and 2.3 of Schedule D of CA
3	Total Length of the Project	75.995		
TYPE OF ALIGNMENT				
4	New Alignment			
5	Realignment			
6	Strengthening			
7	Reconstruction	75.995		
8	Total Length of the Project	75.995		

2.10 Summary of Structures

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

Table 2.5: Summary of Structures

S No	Description	Major Bridges	Minor Bridges	Hume Pipe Culverts	Box/Slab Culverts
1	Retained	1		76	1
2	Widening		08	21	3
3	Reconstruction			22	16
4	New		1		
5	Improvement				
	Total	1	09	119	20

2.11 Toll Plazas

- There are two toll Plazas on the project road at Km. 1+800 & Km.70+000.
- Toll Plaza 1 at Km.1+800 comprises of 4 lanes.
- one lane in each direction is used for four wheelers and the other lane is used as bike lane.
- Toll Plaza 2 which is at Km.70+000 comprises of 6 lanes.
- one lane in each direction is used for four wheelers and the third lane is used as bike lane.
- Toll plaza 1 comprises of Admin building with G+1 floor with control room, UPS and Pantry.
- Toll Plaza 2 has two buildings which houses control room, UPS & Pantry.
- The second building is used as medical aid post, traffic aid post and also used for tolling staff.
- List of tolling equipment provided at site is furnished in the Detailed Report.

2.12 Bus bays/Bus shelters

As per provisions of Schedule C of CA bus shelters are provided at 6 locations. Details are provided below.

Table 2.6: List of Bus shelters

S. No.	Chainage (Km.)	Bus shelter
1	0+000	Bus shelter
2	18+700	Bus shelter
3	19+700	Bus shelter
4	45+200	Bus shelter
5	72+100	Bus shelter
6	75+200	Bus shelter

2.13 Other Project Facilities Provided as per Schedule C of CA

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

- Medical Aid Post: Provided at Toll Plaza location and is operational
- Highway Lighting: Highway lighting is provided at Toll Plaza and is functional.



Km.0+000



CH.0+600



Km. 3+400



Km. 75.995

Figure 2.5: Project Facilities

CHAPTER 3. ROAD INVENTORY & PAVEMENT CONDITION

3.1 General

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

3.2 Road Inventory

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

Table 3.1: Road Inventory

S. No.	Features	Remarks
1	Terrain	Plain rolling Terrain
2	Land Use	Agriculture and forest
3	Two lane length	75.995 km
4	Earthen shoulder	1.0 m to 1.5m Width on site
5	Junctions	18 Nos.
6	Toll Plazas	At Km.1+800 & Km.70+000
7	Sign boards	Sign boards are provided as per Highway requirements
8	Road Markings	Lane markings are provided as per Highway requirement
9	Bus shelters	6 Nos.
10	Highway Lighting	Provided as per requirement
11	Avenue plantation	Provided

3.3 Pavement Condition

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

Table 3.2: Pavement Classification

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

Assessment of the condition of Pavement surface is a key component of infrastructure asset management. The information used across a wide range of business processes which includes: Monitoring the performance of the road; Predicting future pavement conditions and assessing long term needs; Identifying rehabilitation and maintenance treatment options; investigate causes of pavement deterioration and evaluating specific treatment options; The purpose of the pavement

condition survey is to provide a more accurate and detailed investigation of the pavement deterioration in order to assist in determining appropriate rehabilitation treatments.

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

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

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

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

Table 3.3: Pavement condition summary

From (Km.)	To (Km.)	Length (Kms.)	Condition
0+000	75+995	75.995	Good



Km. 3+400



Km. 18+400



Km.6+400

Figure 3.1: Representative Photos of Pavement Condition.

CHAPTER 4. INVENTORY AND CONDITION OF STRUCTURES

4.1 General Assessment and Condition of the 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

1 Major Bridge, 17 Minor Bridges, 134 Pipe culverts, 05 Slab culverts and 06 Box culverts are there along this project road.

Table 4.1 : List of Structures

S. No.	Type of Structure	Numbers
1	Major bridges	1No.
2	Minor Bridge	17Nos.
3	Slab Culverts	5Nos.
4	Box culverts	6Nos.
5	Pipe culverts	134Nos.

The superstructure for major bridge at Ch.: 6+841 is RCC solid slab and the type of superstructure is of RCC conventional wall type supported with open/pile foundations. The Super structure of Minor bridges is of RCC solid slab and the substructures are of PCC conventional wall type supported on open foundations. Detailed inventory and condition survey of bridges are given in **ANNEXURE 2**. The culverts observed along the project road are mainly of two types viz. pipe culverts and RCC slab/box culverts. The condition of most of the culverts is fair except in few locations. Detailed inventory and condition survey of culverts are given in **ANNEXURE 3**.

4.3 Details of Major Bridges

The total length of the major bridge at Km 6+841 is 69.60 m with 4 spans. The superstructure consists of RCC T-girder. It is Supported on RCC wall type piers and abutments. It has bituminous wearing coat, and Elastomeric/neoprene Bearings and buried type expansion joints. RCC railings have to be provided on both sides of the deck.

Table 4.2: List of Major Bridge

Sl. No.	Chainage (Kms.)	Span	Total Length of Bridge (m.)
1	6+841	4 x 17.40	69.600

The condition of the superstructure and substructure is good. The following are the observations on the bridge: Reflector plates and drainage spouts are required. Strip seal expansion joints need to be rectified at some locations.



Figure 4.1 : Overall view of the major bridge at Km. 6+841

4.4 Details of Minor Bridges

There are 17 minor bridges in the project stretch. The type of superstructure for minor bridges is RCC solid slab and the substructure is PCC conventional wall type supported on open foundations. Expansion joints are buried type and bearings are of Tar paper and neoprene bearings. RCC crash barriers are provided on all structures.

Table 4.3: List of Minor Bridges

S. No.	Chainage (Km.)	Span	Total Length of Bridge (m)	Description
1	0+896	2x 6.6m.	13.2	The Minor Bridge has RCC solid slab superstructure supported on RCC wall type piers and abutments. Other features are RCC crash barrier, bituminous wearing coat, and Tar paper Bearings and buried type expansion joints.
2	10+237	2 x 13.8m.	27.6	The Minor Bridge has RCC solid slab superstructure supported on RCC wall type piers and abutments. Other features are Brick parapet is provided, bituminous wearing coat, Elastomeric Bearings and buried type expansion joints.
3	28+785	3 x 15.1m.	45.3	The Minor Bridge has RCC solid slab superstructure supported on RCC wall type piers and abutments. Other features are RCC crash barrier, bituminous wearing coat, and Elastomeric Bearings and buried type expansion joints.
4	30+500	3x 15.3m.	45.9	The Minor Bridge has RCC solid slab superstructure supported on RCC wall type piers and abutments. Other features are RCC crash barrier, bituminous wearing coat, and Elastomeric Bearings and buried type expansion joints.
5	48+752	1x 7.0m.	7.0	The Minor Bridge has RCC solid slab superstructure supported on PCC wall type piers and abutments. Other features are Brick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
6	49+158	1x 9.3m.	9.3	The Minor Bridge has RCC solid slab superstructure supported on PCC wall type piers and abutments.

S. No.	Chainage (Km.)	Span	Total Length of Bridge (m)	Description
				Other features are Brick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
7	50+810	1 x 9.7m.	9.7	The Minor Bridge has RCC solid slab superstructure supported on RCC wall type piers and abutments. Other features are Brick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
8	54+901	1x 9.5m.	9.5	The Minor Bridge has RCC solid slab superstructure supported on PCC wall type piers and abutments. Other features are Brick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
9	56+753	2 x 6.0m. (clear)	13.4	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
10	58+862	2x4.2m. (clear)	9.35	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
11	59+795	2 x 3.4m. (clear)	7.65	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
12	62+629	4 x 4.2m. (clear)	18.25	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
13	63+525	4 x 5.5m. (clear)	23.7	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
14	64+641	2x5.5m. (clear)	12.1	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.
15	71+127	2 x 8.6m.	17.2	The Minor Bridge has RCC solid slab superstructure supported on PCC wall type piers and abutments. Other features are Brick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
16	71+379	2 x 9.9m.	19.8	The Minor Bridge has RCC solid slab superstructure supported on PCC wall type piers and abutments. Other features are rick parapet is provided, bituminous wearing coat, Tar paper Bearings and buried type expansion joints.
17	75+008	2 x 3.5m. (clear)	7.85	The Minor Bridge has RCC Box structure. It has RCC crash barrier, bituminous wearing coat.

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 structural condition of culverts is generally good. Some of the pipe culverts vents have choked with vegetation and vent cleaning is required. In general, the condition of all the structures is found to be 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. Slab/Box Culverts

There are 06 Nos. of Box culverts and 05 Slab culverts in the project stretch. The details of the culverts are as given below.

Table 4.4: List of Slab/Box Culverts

S. No.	Chainage (Km.)	Type	Span (m)
1	0+013	Slab	2 x 1
2	3+383	Slab	1 x 1.5
3	3+885	Box	1 x 4
4	5+718	Slab	1 x 6
5	6+157	Slab	1 x 4
6	6+431	Slab	1 x 3
7	6+703	Box	1 x 4
8	17+464	Box	2 x 3
9	19+750	Box	2 x 3
10	52+010	Box	1 x 4.5
11	52+458	Box	2 x 3

4.5.2. Condition of the Slab/Box Culverts:

The general condition of above slab culverts is good. Maintenance is to be carried out to most of the culverts in the form of vent clearance and Stone Pitching for Quadrants.



Km.3+383



Km. 6+157

Figure 4.2: Representative photos of Slab/ Box Culverts

4.5.3. General Description of the Pipe Culverts

There are 134 Nos. of pipe culverts in the project stretch. The details of the culverts are given below.

Table 4.5: List of Pipe Culverts

S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)	S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)
1	1+369	Pipe	1 x 1.2	68	40+275	pipe	1 x 0.9
2	3+130	Pipe	1 x 1.2	69	40+603	pipe	1 x 1
3	3+678	Pipe	1 x 1.2	70	40+894	pipe	1 x 1
4	7+330	Pipe	1 x 1.2	71	41+377	Pipe	1 x 0.9
5	7+669	Pipe	1 x 0.9	72	41+561	Pipe	1 x 0.9
6	7+900 (EXTRA)	Pipe	1 x 1.2	73	41+708	Pipe	1 x 0.9
7	8+013	Pipe	1 x 0.9	74	42+092	Pipe	1 x 0.9
8	8+154 (8+225)	Pipe	1 x 0.9	75	42+337	Pipe	2 x 1
9	8+466 (8+320)	Pipe	2 x 1.2	76	43+102	Pipe	1 x 1
10	8+577 (8+570)	Pipe	2 x 1.2	77	43+215 (43+195)	Pipe	1 x 0.9
11	8+988 (8+935)	Pipe	2 x 1.0	78	43+331	Pipe	1 x 0.9
12	9+275	Pipe	1 x 1	79	43+556	Pipe	1 x 1
13	9+434	Pipe	3 x 1.2	80	43+767	Pipe	1 x 0.9
14	10+334	Pipe	1 x 0.9	81	43+966 (43+981)	Pipe	1 x 0.9
15	10+398	Pipe	2 x 0.9+1x1	82	44+432	Pipe	1 x 0.9
16	11+035 (11+008)	Pipe	1 x – (Buried)	83	44+565	Pipe	1 x 0.9
17	11+232	Pipe	1 x 0.9	84	44+681	Pipe	2 x 0.9
18	14+028	Pipe	-	85	45+705	Pipe	1 x 0.9
19	14+603	Pipe	2 x 1	86	45+794	Pipe	1 x 0.9
20	15+422	Pipe	1 x 0.9	87	46+122	Pipe	1 x 0.9
21	15+711	Pipe	1 x 1.2	88	46+739	Pipe	1 x 0.9
22	16+026	Pipe	1 x 0.9	89	46+855	Pipe	1 x 0.9
23	16+348	Pipe	1 x 1.2	90	47+291	Pipe	1 x 0.9
24	16+727	Pipe	2 x 1.2	91	49+554	Pipe	1 x 0.9
25	17+943	Pipe	2 x 0.9	92	49+697	Pipe	1 x 0.9
26	18+156	Pipe	2 x 0.9	93	50+400	Pipe	1 x 0.9
27	18+327	Pipe	4 x 1	94	51+900	Pipe	1 x 0.9
28	18+771	Pipe	1 x 1.2	95	53+868	Pipe	2 x 1
29	18+961	Pipe	2 x 1.2	96	54+025	Pipe	1 x 1.2
30	19+349	Pipe	1 x 1.2	97	55+391	Pipe	1 x 1

S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)
31	20+332	Pipe	1 x 0.9
32	20+771	Pipe	2 x 1.2
33	20+876	Pipe	1 x 0.9
34	21+533	Pipe	1 x 1.2
35	21+720	Pipe	3 x 1.2
36	22+131 (21+915)	Pipe	5 x 1.2
37	22+642	Pipe	1 x 1.2
38	23+066	Pipe	1 x 1.2
39	23+385	Pipe	1 x 0.9
40	23+927	Pipe	1 x 1.2
41	24+436	Pipe	4 x 1
42	26+072	Pipe	2 x 1.2
43	26+863	Pipe	1 x 1
44	27+681	Pipe	2 x 1
45	27+813	Pipe	1 x 0.9
46	27+940	Pipe	2 x 1.2
47	28+423	Pipe	-
48	29+174	Pipe	1 x 1
49	29+477	Pipe	Buried
50	30+140	Pipe	2 x 1
51	30+895	Pipe	1 x 1
52	31+510	Pipe	1 x 1
53	32+035	Pipe	2 x 1
54	33+500	Pipe	3 x 1
55	34+110	Pipe	1 x 1
56	34+960	Pipe	2 x 1
57	36+070	Pipe	1 x 0.9
58	36+246	Pipe	1 x 0.9
59	36+669	Pipe	1 x 0.9
60	36+975 (37+085)	Pipe	1 x 0.9
61	37+334 (37+385)	Pipe	1 x 0.9
62	37+516 (37+530)	Pipe	1 x 0.9
63	37+890 (37+899)	Pipe	1 x 0.9

S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)
98	55+760 (EXTRA)	Pipe	1 x 0.9
99	56+335	Pipe	1 x 0.9
100	56+645	Pipe	1 x 0.9
101	58+622	Pipe	1 x 1
102	59+233	Pipe	2 x 0.9
103	60+729	Pipe	2 x 1.2
104	61+673	Pipe	1 x 1
105	62+038	Pipe	1 x 1
106	64+874	Pipe	1 x 1.2
107	65+280	Pipe	Buried
108	65+442 (65+370)	Pipe	1 x 1
109	65+572 (65+530)	Pipe	4 x 1
110	65+870	Pipe	2 x 1
111	66+002 (65+993)	Pipe	1 x 1
112	66+140	Pipe	2 x 1
113	66+350	Pipe	1 x 1
114	67+080	pipe	1 x 1.2
115	67+373	pipe	2 x 1
116	67+440 (EXTRA)	pipe	1 x 1.2
117	68+056	Pipe	1 x 1
118	68+248	Pipe	1 x 1
119	68+651	Pipe	3 x 1.2
120	69+433	Pipe	2 x 1
121	69+898	Pipe	1 x 1.2
122	70+192	Pipe	1 x 1
123	70+873	Pipe	2 x 0.9
124	72+008	Pipe	1 x 1
125	72+274	Pipe	1 x 1
126	72+894	Pipe	2 x 1
127	73+193	Pipe	1 x 0.9
128	73+255	Pipe	1 x 0.9
129	73+373	Pipe	1 x 0.9
130	73+736	Pipe	2 x 0.9

S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)
64	38+335	Pipe	1 x 0.9
65	38+475	Pipe	2 x 0.9
66	39+169	Pipe	1 x 0.9
67	39+498	Pipe	2 x 0.9

S. No.	Chainage (Km.)	Type	No. of Rows& Dia (m.)
131	73+814	Pipe	2 x 1.2
132	74+068	Pipe	2 x 0.9
133	74+549	Pipe	1 x 1
134	75+233	Pipe	1 x 1.2

4.5.4. Condition of the Pipe Culverts

The general condition of above pipe culverts is good. Maintenance is to be carried out to most of the culverts in the form of clearing debris from pipes and removal of weed.



Km.3+130

Figure 4.3: Representative photo of Pipe Culvert

The culverts are in fair condition and can be retained in the present condition with the following Maintenance works.

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

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.

5.3 Review of Pavement Design

As per the pavement design approved in the project, the following conclusions are given.

Table 5.1: Pavement Design Parameters

S. No.	Description/ Pavement layer	Design Parameters	Adopted values
1	Sub Grade CBR (%)	10%	10%
2	Design Life (Years)	8 years for BT 15 years for Granular	8 years for BT 15 years for Granular
3	Design Traffic (MSA)	2.67 MSA for BT 5.86 MSA for Granular	5 MSA for BT 10 MSA for Granular
4	Surface course (BC)	25 mm	25 mm
5	Binder course (DBM)	50 mm	50 mm
6	Base course (WMM)	250 mm	250 mm
7	Sub Base course (GSB)	150 mm	200 mm

5.3.1. Validation of Pavement Design

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

Pavement design validation 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: Real Time Traffic from COD & Project Traffic Current Years with 5% Growth For CMSA (TP1)

FY Year	AADT in Vehicles					CVPD (Veh.)	MSA	CMSA	Year	Remarks
	Car	LCV	BUS	2-AT	MAV					
2015	190	157	7	52	36	252	0.24	0.47	3	Actual
2016	239	189	6	67	42	304	0.29	0.76	4	Actual
2017	259	179	7	65	66	317	0.30	1.07	5	Actual
2018	304	221	12	68	117	418	0.40	1.47	6	Actual
2019	320	216	7	51	148	422	0.40	1.87	7	Actual
2020	391	233	7	59	166	465	0.45	2.32	8	Actual
2021	410	245	8	62	174	488	0.47	2.79	9	Projected
2022	431	257	8	65	183	513	0.49	3.28	10	Projected
2023	453	270	8	68	192	538	0.52	3.79	11	Projected
2024	475	283	9	72	201	565	0.54	4.34	12	Projected
2025	499	298	9	75	211	593	0.57	4.90	13	Projected
2026	524	312	10	79	222	623	0.60	5.50	14	Projected
2027	550	328	10	83	233	654	0.63	6.13	15	Projected

Table 5.3: Real Time Traffic from COD & Project Traffic Current Years with 5% Growth For CMSA (TP-2)

FY Year	AADT in Vehicles					CVPD (Veh.)	MSA	CMSA	Year	Remarks
	Car	LCV	BUS	2-AT	MAV					
2015	248	109	5	25	17	156	0.15	0.26	3	Actual
2016	323	145	8	32	19	204	0.20	0.46	4	Actual
2017	433	166	8	42	33	249	0.24	0.70	5	Actual
2018	466	186	8	47	59	301	0.29	0.98	6	Actual
2019	511	157	4	31	80	272	0.26	1.25	7	Actual
2020	565	165	6	37	85	293	0.28	1.53	8	Actual
2021	594	173	6	39	89	308	0.29	1.82	9	Projected
2022	623	182	6	41	94	323	0.31	2.13	10	Projected
2023	654	191	7	43	99	339	0.33	2.46	11	Projected
2024	687	201	7	45	103	356	0.34	2.80	12	Projected
2025	722	211	7	47	109	374	0.36	3.16	13	Projected
2026	758	221	8	50	114	393	0.38	3.53	14	Projected
2027	795	232	8	52	120	412	0.40	3.93	15	Projected

Based on the above actual traffic, estimated MSA at 8 years and 15 years are 2.32, 6.13 of TP1 respectively. Similarly estimated MSA at 8 years and 15 years of TP2 are 1.53, 3.93 respectively.

Traffic considered in pavement design is more than estimated traffic based on actual traffic. Hence the pavement design adopted is found in order.

Details of Pavement design for Rigid Pavement are as follows:

Table 5.4: Rigid Pavement Design for Toll Plaza

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

The Pavement crust has been designed according to IRC specification and found in order, the adopted/ designed traffic is more than the actual traffic. Hence pavement crust is safe.

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 2020) and 15 years for granular layers respectively (up to end of year 2026), whereas the actual traffic is 3 MSA and 6 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 the 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 – Proposed on or before 2026

Periodic Maintenance for Rigid Pavement – Re-texturing shall be done at least once in 10 years from construction. (As per IRC 58-2015).

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

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

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

Table 6.1: Referred IRC Publications

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

6.2 Existing Road Safety Audit

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

Table 6.2: Existing Road Safety items

S. No.	Item Description		Status	Condition
Road Furniture				
1	Sign Boards	Chevron Signs Village sign boards Information Boards Other Sign Boards Gantry Sign Boards	Available as per site requirement	Good
2	Road Marking	Studs &Lane marking	Available as per site requirement	Good
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.



Km. 3+400



Km. 6+100



Km.6+400



Km.18+000

Figure 6.1: Representative photos during road safety audit

6.3 Conclusion

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

CHAPTER 7. TOLL PLAZA & HTMS

7.1 General

There are two toll Plazas on the project road at Km. 1+800 and Km. 70+000. Each side comprises of 1 normal lanes, 1 extra wide lane. The lane width in normal lanes was 3.2 m and extra wide lane was 4.5 m. The width of islands provided is 1.8 m. The single canopy is provided to cover the toll lanes. Toll plaza buildings are 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 plazas and control rooms is given below.

Table 7.1 : List of Equipment at Toll Plazas and Control Rooms

S. No.	Description	Nos.
1	Audit camera	1
2	AVC	2
3	Barcode reader	1
4	Barrier	3
5	Booth camera	1
6	CCTV camera (Building)	4
7	ETC antenna	1
8	Fog light	1
9	Fog light Controller	1
10	Intercom (Internal)	1
11	KEYBOARD	3
12	Keyboard	3
13	Lan hardware / optical fibre	1
14	LC Cabinet	1
15	LC System	1
16	LPIC	4
17	MBC	1
18	Monitor	8
19	Mouse	4
20	NVR	1
21	OHLS	1
22	Panic Foot Switch	4
23	PFD	2
24	POE SWITCH	1
25	Printer	6
26	RFID reader	1
27	Scanner	1
28	SERVER	1

S. No.	Description	Nos.
29	Smart card	1
30	Smartcard Reader	1
31	Traffic light	4
32	Vehicle Scanner (Photo cell)	1
33	Vehicle Separator	1
34	Violation Alarm	4
35	WIM	1
36	WIM Controller	1
37	Workstation	3

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	Toll Plaza 1	Toll Plaza 2
1	Patrol Vehicle	TVS Bike – 1 No	TVS Bike – 1 No
2	Ambulance	Mahindra Genio – 1 No.	Mahindra Genio – 1 No.
3	Crane	-	1No



Toll Plaza at Km.70+000



Toll Building At Km.70+000

Figure 7.1 :Toll Plaza at Km.70+00

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 compiled and furnished forthwith by the Concessionaire to MPRDC substantially in the form specified in Schedule N of CA.

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

Table 8.1: Year wise Traffic (Vehicles) Details

(A) Silwani Toll Plaza

FY Year	Car	LCV	Bus	Truck	MAV	Total Traffic
Apr-Mar 2015-16	87629	69335	2201	24477	15415	199057
Apr-Mar 2016-17	94444	65451	2499	23697	24030	210121
Apr-Mar 2017-18	110881	80824	4433	24854	42565	263557
Apr-Mar 2018-19	116905	78740	2711	18573	54062	270991
Apr-Mar 2019-20	143066	85347	2644	21587	60609	313253
AACGR* (%)	8.90%	7.07%	4.54%	37.79%	14.53%	15.81%

(B) Sagar Toll Plaza

FY Year	Car	LCV	Bus	Truck	MAV	Total Traffic
Apr-Mar 2015-16	118269	52898	2749	11782	7114	192812
Apr-Mar 2016-17	158096	60667	2839	15451	12060	249113
Apr-Mar 2017-18	170192	67959	3102	17214	21495	279962
Apr-Mar 2018-19	186487	57469	1423	11240	29167	285786
Apr-Mar 2019-20	206912	60419	2057	13611	31163	314162
AACGR* (%)	18.54%	9.88%	8.45%	11.71%	41.38%	16.90%

*AACGR- Annual Average Compound Growth Rate

8.2 Actual Revenue Collection

In accordance with clause 19.5, "During the operation period, the Concessionaire shall furnish to MRPDC within 7 days of completion of each month, a statement of fee substantially in the form set forth in Schedule-M (Monthly fee statement)". As per provisions of CA the concessionaire submitted monthly fee statement and the summary of form submitted under Schedule M during the financial year 2019-20 is given under as Table 8-2.

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

(A) Silwani Toll Plaza

Description	Car	Car(pass)	LCV	Bus	Truck	MAV	Total
In Nos.	57046	6669	38128	2624	20416	55153	180036
Toll Revenue collection in Rs.	1007995	533540	1633890	230080	2106405	11489645	17001555

(B) Sagar Toll Plaza

Description	Car	Car(pass)	LCV	Bus	Truck	MAV	Total
In Nos.	111745	7721	35179	1906	10930	27968	195449
Toll Revenue collection in Rs.	2793665	617670	2286635	250525	1723290	8928275	16600060

The figures shown in Table 8-1 are Real time traffic data (AADT) on project road for the past five years and the growth rate is calculated to be 15.81% and 16.90% in TP-1 and TP-2 respectively. 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% even though the growth as per table 8-1 is >5%.

Based on the base year traffic and growth rate as explained above traffic projections from year 2019-20 to till end of Concession period toll plaza wise are calculated and summarized below in Table 8-3.

Table 8.3: Projected Traffic

(A) Silwani Toll Plaza

FY YEAR	AADT in Vehicles					CVPD* (Veh.)	AADT in PCU					CVPD* (PCU)	Remarks
	Car	LCV	BUS	2-AT	MAV		Car	LCV	Bus	2-AT	MAV		
	PCU Factor						1.0	1.5	3.0	3.0	4.5		
2020	175	104	7	56	151	319	175	157	22	168	680	1026	Actual
2021	183	110	8	59	159	335	183	165	23	176	714	1077	Projected
2022	192	115	8	62	167	351	192	173	24	185	750	1131	Projected
2023	202	121	8	65	175	369	202	181	25	194	787	1188	Projected
2024	212	127	9	68	184	387	212	190	26	204	827	1247	Projected
2025	223	133	9	71	193	407	223	200	28	214	868	1310	Projected
2026	234	140	10	75	202	427	234	210	29	225	911	1375	Projected
2027	246	147	10	79	213	448	246	220	30	236	957	1444	Projected

(B) Sagar Toll Plaza

FY YEAR	AADT in Vehicles					CVPD* (Veh.)	AADT in PCU					CVPD* (PCU)	Remarks
	Car	LCV	BUS	2-AT	MAV		Car	LCV	Bus	2-AT	MAV		
	PCU Factor						1.0	1.5	3.0	3.0	4.5		
2020	327	96	5	30	77	208	327	145	16	90	345	595	Actual
2021	344	101	5	31	80	219	344	152	16	94	362	625	Projected
2022	361	106	6	33	84	230	361	159	17	99	380	656	Projected
2023	379	112	6	35	89	241	379	167	18	104	399	689	Projected
2024	398	117	6	36	93	253	398	176	19	109	419	723	Projected
2025	418	123	7	38	98	266	418	185	20	115	440	759	Projected
2026	439	129	7	40	103	279	439	194	21	120	462	797	Projected
2027	461	136	7	42	108	293	461	203	22	126	485	837	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 below.

Table 8.4: Toll Revenue Inputs

Particular	Toll plaza 1	Toll plaza 2
Location	Km. 1+800	Km. 70+000
4 lane length in km	0	0
2 lane length in km	30	35.995
Agreement Date	08-09-2011	08-09-2011
Appointed Date	27-02-2012	27-02-2012
Concession period	15 Years	15 Years
Commercial operation date	28-02-2013	29-05-2013
Concession End Date	26-02-2027	26-02-2027
Traffic study year	2019-2020	2019-2020
Vehicle Type	AADT	AADT
Car/Jeep/Van	175	327
2-axle Bus	104	96
LCV/LGV	7	5
2A-Truck	56	30
MAV (2A-6A)	151	77
Growth Rate (%)	5	5

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

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

Financial Year	Annual Revenue of TP1 (Km. 1+800)	Annual Revenue of TP2 (Km. 70+000)	Total	Remarks
2019-20	170.016	166.001	336.016	Actual
2020-21	184.945	180.404	365.349	
2021-22	201.519	194.742	396.261	
2022-23	221.880	217.400	439.280	
2023-24	237.959	235.266	473.225	
2024-25	258.338	255.429	513.767	
2025-26	283.162	273.314	556.476	
2026-27	277.773	269.457	547.230	332 Days

CHAPTER 9. OPERATION AND MAINTENANCE

9.1 General

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

9.2 Inspection

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

- **Visual Inspection:** Visual inspections are done at frequent intervals, and are intended to determine any potential traffic hazards to the road user or hampering the aesthetics of the project stretch. Visual Inspections are meant to identify defects that constitute an imminent or immediate hazard to the public.
- **Detailed Inspection:** Detailed Inspections often require some measuring instruments, are done less frequently and are intended more towards determining performance and behavior of various elements. These inspections also indicate if there is any need for thorough inspections. Detailed inspections are carried out primarily to establish programs of periodic or major maintenance tasks, and enhancement requirements not requiring urgent execution
- **Thorough Inspection:** Thorough Inspections are aimed at finding the cause and remedy of specific problems and at specific locations. Specialist's inspections are required once in a while. Thorough Inspections shall be carried out with highly sophisticated instruments

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

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

9.3 Operations

9.3.1. Traffic Flow Operation & Traffic Management Plan

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

- i. Permitting smooth and uninterrupted flow of traffic during normal operating conditions.
- ii. Functioning of the Toll System including charging and collecting the fees from the road user in accordance with the CA.
- iii. carrying out preventive and periodic maintenance of the Project road;
- iv. undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;

- v. Undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment;
- vi. Functioning of the lighting system;
- vii. Functioning of the Patrolling System
- viii. Functioning of rescue and medical aid services
- ix. Ambulance as and when required
- x. Functioning of the Project Facilities
- xi. Administrative, Operational and Maintenance Base Camp
- xii. Truck Lay byes
- xiii. Pickup Bus stops / Bus Bays
- xiv. protection of the environment and provision of equipment and materials therefor;
- xv. Operation and maintenance of all communication, control and administrative systems necessary for the efficient operation of the Project road
- xvi. complying with Safety Requirements in accordance with Article 18.

9.4 Operation of Toll Plazas

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

9.5 Maintenance of Project road

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

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

- i. Preventive Maintenance
- ii. Routine Maintenance
- iii. Periodic Maintenance
- iv. Special repairs

9.5.1. Preventive Maintenance

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

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

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

9.5.2. 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.

9.5.3. Periodic Maintenance

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

Table 9.1: Schedule and status of for Periodic Maintenance

Description	Schedule of Major Maintenance	Status of Major Maintenance
1 st Periodic Maintenance -Phase 1	30 Km Micro surfacing in 2018	Executed
1 st Periodic Maintenance - Phase 2	35 Km BC Overlay in 2019	Executed
1 st Periodic Maintenance - Phase 3	18 Km BC Overlay in 2020	Executed
1 st Periodic Maintenance - Phase 4	7 Km BC Overlay in 2021	Work in Progress
2 nd Periodic Maintenance	76 Km BC Overlay in 2026	Scheduled

9.5.4. Special Repairs

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

- Culvert and bridge repairs
- Retaining wall repairs and construction;
- Construction of Diversions;
- Floodway repairs; and
- Flood damage restoration works, etc.

9.6 Review of Test Reports

9.6.1. Bump Integrator Test:

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

The test was conducted in the month of Aug, 2020. As per Schedule K of CA, if the stretch exceeds 3000mm in a KM shall be rectified. No stretch exceeds the permissible limit.

9.6.2. 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 Dec2019. The test report has been verified and found within permissible limits as per IRC 81.

9.7 O&M Forecast

The O&M costs were estimated based on various parameters of CA, 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	Toll Plaza Operator (Including Electricity and Fuel Charges/ AMC/Other expenses/Insurances/Misc.	Total cost per year
2021	0.259	0.424	-	0.61	1.29
2022	0.267	0.437		0.63	1.33
2023	0.275	0.450		0.65	1.37
2024	0.283	0.463		0.67	1.41
2025	0.292	0.477		0.69	1.46
2026	0.300	0.492	7.01	0.71	8.51
2027	0.282	0.461	7.01	0.66	8.41
Total	1.96	3.20	14.02	4.61	23.79

CHAPTER 10. REVIEW OF CONCESSION AGREEMENT

10.1 General: Scope of Work (Article 2)

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

- Construction of the Project road on the Site set forth in Schedule-A and as specified in Schedule-B of CA together with provision of Project Facilities as specified in Schedule-C of CA, and in conformity with the Specifications and Standards set forth in Schedule-D of CA;
- Operation and maintenance of the Project road in accordance with the provisions of the Agreement;
- Performance and fulfillment of all other obligations of the Concessionaire in accordance with the provisions of the Agreement and matters incidental

10.2 Letter of Award

After evaluation of the bids received, Authority will select one bidder considering their score in technical and financial bids. Further Authority will issue a Letter called LOA (Letter of Award) to the selected bidder requiring the execution of agreement within stipulated time. The issued LOA copy given in **ANNEXURE 6**.

10.3 Conditions precedent (Article 4)

Conditions precedent to be fulfilled by the Authority

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

Conditions precedent to be fulfilled by the Concessionaire

- Provide performance security to the Authority
- Executed and procured Escrow Agreement & Substitution Agreement
- Procured all applicable permits specified in Schedule E of CA
- Executed financing Agreements and delivering 3 copies of Financial Package
- Delivered to the Authority confirmation in original of the correctness of their representations and warranties set forth in Agreement and a legal opinion from the legal 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 fulfill its obligations under financing Agreements
- To make reasonable efforts to facilitate the acquisition of land required for execution
- Transfer the Project road upon termination of the Concession Agreement

10.5 Obligations relating to the Competing Roads (Clause 6.3)

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

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.

10.6.1. Tests (Clause 13.3)

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

10.7 Provisional Completion Certificate (Clause 14.3)

- Upon completion of works in accordance with the specifications and standards set forth in the Schedule B, C and D of CA after determining the tests on 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. Copy of the Completion Certificate is provided 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 that were initiated during construction period and consented by the MPRDCL. 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 road
- Collecting and appropriating the Fee
- Minimizing the disruption to traffic in the event of accidents
- Undertaking routine maintenance including prompt repairs of pot holes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices
- Undertaking major maintenance such as resurfacing of pavements, repairs and refurbishments of tolling system and other equipment
- Preventing any unauthorized use of the Project road.
- Protection of environment and provision of equipment and materials
- Complying with safety Requirements in accordance with the provisions of the CA.

10.12 Maintenance Requirements (Clause 17.2)

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

10.13 Maintenance Manual (Clause 17.3)

No later than 180 (one hundred and eighty days prior to the Scheduled Two Laning Date, the Contractor shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual (the “**Maintenance Manual**”) for the regular and preventive maintenance of the Project in conformity with the Specifications and Standards, Maintenance Requirements, Safety Requirements and Good Industry Practice, and shall provide 5 (five) copies thereof to the Authority and 2 (two) copies to the Independent Engineer. The Maintenance Manual shall be revised and updated once every 3 (three) years and the provisions of this Clause shall apply, mutatis mutandis, to such revision.

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

10.16 Monthly status reports (Clause 19.1)

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

10.17 Monthly Fee Statement (Clause 19.5)

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

10.18 Annuity (Clause 25.1.1)

The Annuity payment of Rs 9.49 Crores is due and payable by the Authority to the Concessionaire for each six months after COD as set forth in Clause 25.2.1 and Schedule Y of CA.

Table 10.1: Status of Annuity Payments

S No.	Particulars	Payment Paid on
1	1 st Annuity	17-Oct-13
2	2 nd Annuity	31-Mar-14
3	3 rd Annuity	1-Oct-14
4	4 th Annuity	31-Mar-15
5	5 th Annuity	28-Sep-15
6	6 th Annuity	04-Apr-16
7	7 th Annuity	3-Oct-16
8	8 th Annuity	03-Apr-17
9	9 th Annuity	4-Dec-17
10	10 th Annuity	17-Apr-18
11	11 th Annuity	16-Oct-18
12	12 th Annuity	18-Apr-19
13	13 th Annuity	30-Sep-19
14	14 th Annuity	27-Mar-20
15	15 th Annuity	25-Sep-20

10.19 Concession Fee (Article 26)

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

- Yearly the Concessionaire is paying the Concession Fee to the MPRDC.

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 CA, the Concessionaire shall affect 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 Property
			From	To	
Civil Engineering Completed Risk	National Insurance Company Ltd	321300441910001984	27.03.2020	26.03.2021	Road & Structure: Toll Building & Toll Booths, TMS, HTMS, Office & IT equipment, Electronic Equipment, Road Furniture, Fixtures, electrical Poles Lighting & Fittings, Sign boards & Safety Barrier
Electronic Equipment Insurance Policy schedule	Oriental Insurance Company Ltd	171200/44/2021/40	08.09.2020	07.09.2021	Electronic Equipment installed in the Project road
Employees Compensation Insurance Policy	HDFC ERGO General Insurance Company Ltd	3114203387794500000	19.5.2020	18.05.2021	All categories of Employees of the Contractor & sub-contractor engaged in the Project

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

12.3 Condition of Structures

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

12.4 Project Facilities

Two Toll Plazas are constructed one at Km.1+800 & the other Km.70+000. Both are 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 well. Highway lighting is provided at toll plaza locations and the same is found functional.

12.5 Road safety

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

12.6 Traffic Growth

Based on real time, traffic data was extracted from Schedule N of CA, the traffic growth observed is to 15.81% and 16.90% in TP-1 and TP-2 respectively, where as 5% growth is considered while evaluating forecast of traffic volumes.

12.7 Maintenance

- Routine maintenance is being carried out by O&M contractor effectively, based on documents reviewed, time to time observations made by client/Authority are being complied and no outstanding NCR's are to be attended as on date.
- Major maintenance (MM) /Periodic maintenance was carried recently and next MM is scheduled in the year 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	
From	To	Cracking (%)	Ravelling (%)	Potholes (%)	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		PS & ES	F	F	LD	F
1+000	2+000								G		ES	F	F	ULD	PF
2+000	3+000	3	1						F		ES	F	F	ULD	PF
3+000	4+000								G		ES	F	F	ULD	PF
4+000	5+000	4	2						F		ES	F	F	ULD	PF
5+000	6+000								G		ES	F	F	ULD	PF
6+000	7+000	3	2	1					F		ES	F	F	ULD	PF
7+000	8+000								G		ES	F	F	ULD	PF
8+000	9+000								G		ES	F	F	ULD	PF
9+000	10+000		2	3					F		ES	F	F	ULD	PF
10+000	11+000	1	3	1					F		ES	F	F	ULD	PF
11+000	12+000								G		ES	F	F	ULD	PF
12+000	13+000								G		ES	F	F	ULD	PF
13+000	14+000								G		ES	F	F	ULD	PF
14+000	15+000								G		ES	F	F	ULD	PF
15+000	16+000								G		ES	F	F	ULD	PF
16+000	17+000								G		PS & ES	F	F	LD	F
17+000	18+000								G		PS & ES	F	F	LD	F

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	
From	To	Cracking (%)	Ravelling (%)	Potholes (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P /VP)		Composition	Condition (Fair / Poor / Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***
18+000	19+000								G		ES	F	F	ULD	PF
19+000	20+000								G		ES	F	F	ULD	PF
20+000	21+000								G		ES	F	F	ULD	PF
21+000	22+000	1	3						F		ES	F	F	ULD	PF
22+000	23+000								G		ES	F	F	ULD	PF
23+000	24+000								G		ES	F	F	ULD	PF
24+000	25+000								G		ES	F	F	ULD	PF
25+000	26+000		5						F		ES	F	F	ULD	PF
26+000	27+000								G		ES	F	F	ULD	PF
27+000	28+000								G		ES	F	F	ULD	PF
28+000	29+000	2	4						F		ES	F	F	ULD	PF
29+000	30+000								G		PS & ES	F	F	LD	F
30+000	31+000								G		ES	F	F	ULD	PF
31+000	32+000								G		ES	F	F	ULD	PF
32+000	33+000								G		ES	F	F	ULD	PF
33+000	34+000	2	3						F		ES	F	F	ULD	PF
34+000	35+000								G		ES	F	F	ULD	PF
35+000	36+000								G		ES	F	F	ULD	PF
36+000	37+000								G		ES	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	
From	To	Cracking (%)	Ravelling (%)	Potholes (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P/VP)		Composition	Condition (Fair / Poor / Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***
37+000	38+000								G		ES	F	F	ULD	PF
38+000	39+000								G		ES	F	F	ULD	PF
39+000	40+000	1	1	1					F		ES	F	F	ULD	PF
40+000	41+000								G	1-1.5	ES	F	F	ULD	PF
41+000	42+000								G		ES	F	F	ULD	PF
42+000	43+000								G	1-1.5	ES	F	F	ULD	PF
43+000	44+000								G		ES	F	F	ULD	PF
44+000	45+000								G	1.5-2.5	ES	F	F	ULD	PF
45+000	46+000								G		PS & ES	F	F	LD	F
46+000	47+000								G	1-1.5	ES	F	F	ULD	PF
47+000	48+000								G		ES	F	F	ULD	PF
48+000	49+000								G	1.5-2.5	ES	F	F	ULD	PF
49+000	50+000								G		ES	F	F	ULD	PF
50+000	51+000								G	1.5	ES	F	F	ULD	PF
51+000	52+000	5	2						F		ES	F	F	ULD	PF
52+000	53+000								G		ES	F	F	ULD	PF
53+000	54+000								G		ES	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	
From	To	Cracking (%)	Ravelling (%)	Potholes (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P/VP)		Composition	Condition (Fair / Poor / Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***
54+000	55+000								G		ES	F	F	ULD	PF
55+000	56+000								G		ES	F	F	ULD	PF
56+000	57+000								G		ES	F	F	ULD	PF
57+000	58+000								G	1.5	ES	F	F	ULD	PF
58+000	59+000	2	3						F	1.5	ES	F	F	ULD	PF
59+000	60+000								G		ES	F	F	ULD	PF
60+000	61+000								G		ES	F	F	ULD	PF
61+000	62+000								G		ES	F	F	ULD	PF
62+000	63+000								G		ES	F	F	ULD	PF
63+000	64+000	1	3	1					F		ES	F	F	ULD	PF
64+000	65+000								G		ES	F	F	ULD	PF
65+000	66+000								G	1.5	ES	F	F	ULD	PF
66+000	67+000								G		ES	F	F	ULD	PF
67+000	68+000								G	1.5	ES	F	F	ULD	PF
68+000	69+000								G		ES	F	F	ULD	PF
69+000	70+000								G		ES	F	F	ULD	PF
70+000	71+000								G		ES	F	F	LD	F
71+000	72+000								G		ES	F	F	ULD	PF
72+000	73+000								G		PS & ES	F	F	LD	F

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	
From	To	Cracking (%)	Ravelling (%)	Potholes (%)	Bleeding (%)	Rutting	Patching (%)	Speed (km/hr)	Quality (G/F/P/VP)		Composition	Condition (Fair / Poor/ Damaged)		Type (LD/ULD/CD/NO)	Condition (PF/F)***
73+000	74+000								G		ES	F	F	ULD	PF
74+000	75+000								G		PS & ES	F	F	LD	F
75+000	75+995								G		PS & ES	F	F	LD	F

Annexure 2: Condition of Bridges

S.No.	Chainage (Km.)	Type of Structure	Substructure	Superstructure	Expansion Joint	Approach slabs	Wearing coat	Bearings	Quadrant Pitching	Toe wall
1	0+896	Minor Bridge	Good	Good	Good	Good	Good	-	Fair	-
2	6+841	Major Bridge	Good	Good	Good	Good	Good	-	Fair	-
3	10+237	Minor Bridge	Good	Good	Good	Fair	Good	-	Good	-
4	28+788	Minor Bridge	Good	Good	Good	Good	Fair	-	Good	-
5	30+500	Minor Bridge	Good	Good	Good	Good	Good	-	Fair	-
6	48+752	Minor Bridge	Good	Good	Good	Good	Good	-	Good	-
7	49+158	Minor Bridge	Good	Good	Good	Good	Good	-	Fair	-
8	50+810	Minor Bridge	Good	Good	Good	Good	Good	-	Good	-
9	54+901	Minor Bridge	Good	Good	Good	Good	Good	-	Good	-
10	56+753	Minor Bridge	Good	Good	-	Good	Good	-	Fair	-
11	58+862	Minor Bridge	Good	Good	-	Good	Good	-	Good	-
12	59+795	Minor Bridge	Good	Good	-	Good	Good	-	Fair	-
13	62+629	Minor Bridge	Good	Good	-	Good	Good	-	Fair	-
14	63+525	Minor Bridge	Good	Good	-	Good	Fair	-	Fair	-
15	64+641	Minor Bridge	Good	Good	-	Good	Good	-	Good	-
16	71+127	Minor Bridge	Good	Fair	Good	Good	Good	-	Good	-
17	71+379	Minor Bridge	Good	Good	Good	Good	Good	-	Good	-
18	75+008	Minor Bridge	Good	Good	-	Good	Good	-	Fair	-

Annexure 3: Condition of Culverts

Box /Slab Culverts

S. No	Chainage (Km.)	Condition	Return wall	Quadrant pitching	Toe wall	Aprons	Parapet wall
1	0+013	Good	Fair	Fair	Fair	-	Fair
2	3+383	Good	Good	Good	Good	-	Good
3	3+885	Good	Good	Good	Good	-	Good
4	5+718	Good	Good	Fair	Fair	-	Good
5	6+157	Good	Good	Good	Fair	-	Good
6	6+431	Good	Good	Good	Fair	-	Good
7	6+703	Good	Good	Good	Good	-	Good
8	17+464	Good	Good	Good	Good	-	Good
9	19+750	Good	Good	Fair	Fair	-	Good
10	52+010	Good	Good	Fair	Fair	-	Good
11	52+458	Good	Good	Good	Good	-	Good

Hume Pipe Culverts

S. No	Chainage (km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
1	1+369	Good	Good	Fair	-
2	3+130	Good	Good	Fair	-
3	3+678	Good	Good	Fair	-
4	7+330	Good	Good	Fair	-
5	7+669	Good	Good	Fair	-
6	7+900	Good	Good	Fair	-
7	8+013	Good	Good	Fair	-
8	8+154	Good	Good	Fair	-
9	8+466	Good	Good	Fair	-
10	8+577	Good	Good	Fair	Good
11	8+988	Good	Good	Fair	Good
12	9+275	Good	Good	Fair	Good
13	9+434	Good	Good	Fair	Good
14	10+334	Good	Good	Fair	-
15	10+398	Good	Good	Fair	-
16	11+035	Good	Good	Fair	-
17	11+232	Good	Good	Fair	-
18	14+028	Good	Good	Fair	-
19	14+603	Good	Good	Fair	-
20	15+422	Good	Good	Fair	-
21	15+711	Good	Good	Fair	-
22	16+026	Good	Good	Fair	-
23	16+348	Good	Good	Fair	Good

S. No	Chainage (km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
24	16+727	Good	Good	Fair	-
25	17+943	Good	Good	Fair	-
26	18+156	Good	Good	Fair	Good
27	18+327	Good	Good	Fair	-
28	18+771	Good	Good	Fair	-
29	18+961	Good	Good	Fair	-
30	19+349	Good	Good	Fair	-
31	20+332	Good	Good	Fair	-
32	20+771	Good	Good	Fair	Good
33	20+876	Good	Good	Fair	-
34	21+533	Good	Good	Fair	Good
35	21+720	Good	Good	Fair	Good
36	22+131	Good	Good	Fair	-
37	22+642	Good	Good	Fair	-
38	23+066	Good	Good	Fair	-
39	23+385	Good	Good	Fair	Good
40	23+927	Good	Good	Fair	Good
41	24+436	Good	Good	Fair	Good
42	26+072	Good	Good	Fair	-
43	26+863	Good	Good	Fair	-
44	27+681	Good	Good	Fair	-
45	27+813	Good	Good	Fair	-
46	27+940	Good	Good	Fair	-
47	28+423	Fair	Fair	Fair	-
48	29+174	Good	Good	Fair	Good
49	29+477	Fair	Fair	Fair	Good
50	30+140	Good	Good	Fair	-
51	30+895	Good	Good	Fair	-
52	31+510	Good	Good	Fair	-
53	32+035	Good	Good	Fair	-
54	33+500	Good	Good	Fair	-
55	34+110	Good	Good	Fair	-
56	34+960	Good	Good	Fair	-
57	36+026	Good	Good	Fair	-
58	36+246	Good	Good	Fair	-
59	36+669	Good	Good	Fair	-
60	36+975	Good	Good	Fair	-
61	37+334	Good	Good	Fair	-
62	37+516	Good	Good	Fair	-
63	37+899	Good	Good	Fair	-
64	38+335	Good	Good	Fair	-

S. No	Chainage (km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
65	38+475	Good	Good	Fair	-
66	39+169	Good	Good	Fair	Good
67	39+498	Good	Good	Fair	-
68	40+275	Good	Good	Fair	-
69	40+603	Good	Good	Fair	-
70	40+894	Good	Good	Fair	-
71	41+377	Good	Good	Fair	-
72	41+561	Good	Good	Fair	-
73	41+708	Good	Good	Fair	-
74	42+092	Good	Good	Fair	-
75	42+337	Good	Good	Fair	-
76	43+102	Good	Good	Fair	Good
77	43+215	Good	Good	Fair	-
78	43+331	Good	Good	Fair	-
79	43+556	Good	Good	Fair	-
80	43+767	Good	Good	Fair	-
81	43+966	Good	Good	Fair	-
82	44+432	Good	Good	Fair	-
83	44+565	Good	Good	Fair	-
84	44+681	Good	Good	Fair	-
85	45+705	Good	Good	Fair	-
86	45+794	Good	Good	Fair	-
87	46+122	Good	Good	Fair	-
88	46+739	Good	Good	Fair	-
89	46+855	Good	Good	Fair	-
90	47+291	Good	Good	Fair	-
91	49+554	Good	Good	Fair	-
92	49+697	Good	Good	Fair	-
93	50+400	Good	Good	Fair	-
94	51+900	Good	Good	Fair	-
95	53+868	Good	Good	Fair	-
96	54+025	Good	Good	Fair	-
97	55+391	Good	Good	Fair	-
98	55+760	Good	Good	Fair	Good
99	56+335	Good	Good	Fair	-
100	56+645	Good	Good	Fair	-
101	58+622	Good	Good	Fair	-
102	59+233	Good	Good	Fair	-
103	60+729	Good	Good	Fair	-
104	61+673	Good	Good	Fair	-
105	62+038	Good	Good	Fair	Good

S. No	Chainage (km.)	Hume Pipe	Head wall	Quadrant pitching	Toe wall
106	64+874	Good	Good	Fair	Good
107	65+280	Fair	Fair	Fair	-
108	65+442	Good	Good	Fair	-
109	65+572	Good	Good	Fair	-
110	65+870	Good	Good	Fair	-
111	66+002	Good	Good	Fair	-
112	66+140	Good	Good	Fair	-
113	66+350	Good	Good	Fair	-
114	67+070	Good	Good	Fair	-
115	67+373	Good	Good	Fair	-
116	67+440	Good	Good	Fair	-
117	68+056	Good	Good	Fair	-
118	68+248	Good	Good	Fair	Good
119	68+651	Good	Good	Fair	Good
120	69+433	Good	Good	Fair	Good
121	69+898	Good	Good	Fair	-
122	70+192	Good	Good	Fair	-
123	70+873	Good	Good	Fair	-
124	72+008	Good	Good	Fair	-
125	72+274	Good	Good	Fair	-
126	72+894	Good	Good	Fair	-
127	73+195	Good	Good	Fair	-
128	73+255	Good	Good	Fair	-
129	73+373	Good	Good	Fair	-
130	73+736	Good	Good	Fair	-
131	73+814	Good	Good	Fair	-
132	74+068	Good	Good	Fair	Good
133	74+549	Good	Good	Fair	Good
134	75+233	Good	Good	Fair	-

Annexure 4: Toll Revenue Calculations

Toll Plaza-I & II:

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

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

Vehicle Type	Traffic (AADT)	Traffic (AADT)
	Km.1+800	Km.70+000
Car/Taxi/Van	175	327
LCV	104	96
Bus	7	5
Truck	56	30
MAV	151	77

2. Traffic Growth Rates

Table-2: Details of Growth rates adopted

Year	Car	LCV	BUS	Truck	MAV
2019-25	5.00	5.00	5.00	5.00	5.00
2025-30	5.00	5.00	5.00	5.00	5.00

3. Trip Distribution Ratio as per the Toll Data.

Table-3: Details of Trip Distribution

A. TP-1: Km.1+800 (Silwani) (Base Year 2019-20)

Vehicle Type	Single Trip	Local Pass	Total
Car/Taxi/Van	90%	10%	100%
LCV	100%	0%	100%
Bus	100%	0%	100%
Truck	100%	0%	100%
MAV	100%	0%	100%

B. TP-1: Km.70+000 (Sagar) (Base Year 2019-20)

Vehicle Type	Single Trip	Local Pass	Total
Car/Taxi/Van	94%	6%	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	Km.1+800 (Silwani)	Km.70+000 (Sagar)
Car/Taxi/Van	20	25
LCV	45	65
Bus	90	135
Truck	105	160
MAV	210	320

Toll Plaza-1 Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	1007995	533540	1633890	230080	2106405	11489645	17001555	170.016	170.016
2020-21	1197966	595231	1801548	247968	2250864	12400951	18494527	184.945	354.961
2021-22	1257864	624992	1891625	274831	2475950	13626626	20151890	201.519	556.480
2022-23	1320758	694844	2206896	303761	2717918	14943867	22188044	221.880	778.360
2023-24	1386795	770119	2317241	318949	2977893	16024913	23795910	237.959	1016.319
2024-25	1456135	808625	2433103	351641	3257071	17527248	25833823	258.338	1274.657
2025-26	1528942	893743	2810234	386805	3556721	19139755	28316201	283.162	1557.819
2026-27	2006736	938430	2950746	424607	3734557	20483218	27777298	277.773	1835.592

Toll Plaza-2 Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	2793665	617670	2286635	250525	1723290	8928275	16600060	166.001	166.001
2020-21	2933306	689088	2585657	280182	1893623	9658563	18040418	180.404	346.405
2021-22	3079972	723542	2714939	304698	2048555	10602468	19474175	194.742	541.147
2022-23	3880764	804409	3054307	330965	2214247	11455275	21739967	217.400	758.546
2023-24	4074802	891553	3207022	359097	2457814	12536266	23526555	235.266	993.812
2024-25	4278542	936131	3591865	389215	2650454	13696718	25542925	255.429	1249.241
2025-26	4492470	1034671	3771458	421447	2856213	14755100	27331359	273.314	1522.555
2026-27	4717093	1086405	4207533	455929	3075922	16081192	26945732	269.457	1792.012

Summary:

Toll Plaza-1 &2 Total Revenue:

Years	Car/Jeep	Car/Jeep (local pass)	LCV	Bus	Trucks	MAV	Total in RS	Total in Lakh.	Cumulative (in Lacs)
2019-20	3801660	1151210	3920525	480605	3829695	20417920	33601615	336.016	336.016
2020-21	4131272	1284319	4387205	528150	4144487	22059514	36534946	365.349	701.366
2021-22	4337836	1348535	4606565	579529	4524506	24229094	39626064	396.261	1097.626
2022-23	5201522	1499253	5261203	634726	4932165	26399142	43928011	439.280	1536.906
2023-24	5461598	1661672	5524263	678046	5435707	28561178	47322465	473.225	2010.131
2024-25	5734678	1744756	6024968	740856	5907524	31223966	51376747	513.767	2523.898
2025-26	6021412	1928414	6581692	808252	6412934	33894855	55647559	556.476	3080.374
2026-27	6723829	2024835	7158279	880535	6810479	36564410	54723030	547.230	3627.604

Annexure 5: Operation & Maintenance cost

Routine Maintenance cost for 1 year									
S. No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
1	General Cleaning in Carriageway & Shoulders Rural area	Monthly	Km	75.995	12	4	350	12,76,716	04 Nos. of Labour
2	General Cleaning in Carriageway & Shoulders Urban area	Twice in a month	Km	3.7	24	4	350	1,24,320	04 Nos. of Labour
3	Watering in Median Plants	Once in Week	Km	3.7	52	1	1939	3,73,064	01 Nos. of Labour
6	ROW Cleaning	Half yearly	Km	37.9975	2	5	350	1,32,991	5 Nos of labour per KM (50% of the Project length)
7	Cleaning of Culverts	Half yearly	Nos	147	2	2	650	3,82,200	3 Nos. of Labour along with JCB or Excavator
8	Road Furniture Cleaning	Quarterly	Km	75.995	4	1	350	1,06,393	02 Nos. of Labour
9	Maintenance of Bus shelters	Monthly	Nos	6	6	1	350	12,600	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
Total								24,95,084	
	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%

Routine Maintenance cost for 1 year									
S. No.	Item		Unit	No	Frequency per year	Quantity	Rate	Amount	Remarks
									Rental per year) including maintenance
2	Toll plaza AMC	Yearly	Nos		12	1	5000	60,000	10000/month
	Total							75,000	
1	Ambulance	Monthly	Nos	12		1	10000	10000	(1200000 is the cost of vehicle, 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)
	Consumables for Route Patrolling & Crane	Monthly	Nos	12		1	500	6000	2500 Per month for per set (Per set - Per toll plaza)
								22,000	
Grand Total								25,92,084.00	

Incidental cost for 1 year

S. No	Item		Unit	No	Frequency	Quantity	Rate	Amount	Remarks
1	Road marking	Half yearly	Sqm	1	1	5852	516	30,19,632	33 % of Total Project length on B/S for 1 year
3	Maintenance of Earthen Shoulder	Half yearly	Cum	1	3	1139.925	225	7,69,449	5% of total Shoulder length throughout the project
4	Sign Board	Quarterly	Km	1	1	25	4000	1,00,000	5 % of Total sign boards per half year (considered 500 Nos.)
5	MBCB	Monthly	RMT			75	2400	1,80,000	5% of Total qty per year - (considered 2400 per number)
6	Mile Stone (KM Stone/ HM Stone / ROW stone etc.)	Quarterly	Nos	75.995	4	19	2250	1,71,000	5 % of total stones per year (unable to understand the backup)
Total amount for 1 Year								42,40,081	

Operational Expenses

S.NO.	PARTICULARS	Amount
1	Man Power	₹ 34,08,000
2	Fuel for Generator & Vehicles	₹ 12,20,560
3	Electricity	₹ 13,20,000
4	Stationary	₹ 10,000
5	Replacement of Electrical Fixtures	₹ 66,080
6	Refurbishment of Toll Plaza Equipment	₹ 75,000
	Total Amount	₹ 60,99,640

Summary Of Major Maintenance




Description	Due date	Base cost	Esc Period	Escalation Rate per Year	Cost of MMR on due date @ 5% Escalation	In crores
Date of Estimation	1/20/2021					
1st Major Maintenance - Highway	4/1/2026	121,274,401	5.20	3.0%	140,183,239	14.02
				Total	₹ 140,183,239	14.02

Major Maintenance BOQ

BOQ Item No.	DESCRIPTION	Unit	QUANTITY	RATE	AMOUNT
	Pavement (Asphalt & Concrete)				
1	Providing and applying tack coat with Rapid Setting Bitumen Emulsion using emulsion pressure distributor on the prepared bituminous/granular surface cleaned with mechanical broom, Ref. to Technical specification 503.			-	
(a)	On Bituminous surface @ 2.0 kg to 3.0 kg/10 sq.m.	Sqm	537,515.00	14.00	7,525,210
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 Tire 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	
1	Semi Dense Bituminous concrete	Cum	8,145.98	6,800.00	55,392,630
2	Micro surfacing	Sqm	265,982.50	185.00	49,206,763
3	Repair of joint Grooves with Epoxy Mortar Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints	MTRS	-	250.00	

BOQ Item No.	DESCRIPTION	Unit	QUANTITY	RATE	AMOUNT
	in concrete pavements using epoxy mortar or epoxy concrete)				
4	Texturing of Rigid pavement (considering 50% for 7 years)	Sqm	-	130.00	
	Total				112,124,603
	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	
2	Providing and laying lane markings of hot applied thermoplastic compound 2.5 mm thick including reflectorizing glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes,Ref. to Technical specification 803.	Sqm	17,732.17	516.00	9,149,798
3	Road Studs	Nos	-	750.00	
	Total			-	9,149,798
	Grand Total				121,274,401

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-S-J-S/2010/ 4916 Bhopal, dated 27 July, 2011	
✓ M/s Dilip Buildcon Ltd., E-5/99, Arera Colony, Bhopal	
Sub: Regarding, Strengthening, Widening, Maintaining and Operating of Silwani-Sultanganj-Jaisinghnagar-Sagar Road on BOT(Toll + Annuity)basis	
<p>In response to your Pre-Qualification you have submitted Technical and Financial Bid for development of Silwani-Sultanganj-Jaisinghnagar -Sagar 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.</p> <p>Also refer to your bid documents containing an unconditional price bid of ₹ 9.49 crores (Rupees nine crores forty nine lacs only) as Annuity Amount payable in terms of Clause 25 of the Concession Agreement.</p> <p>Pursuant to our acceptance of your tender and decision to award the work to you, you are advised to send your acceptance and sign the Concession Agreement within the time stipulated in the R.F.P.documents.</p> <p style="text-align: right;">Yours faithfully  (Neeraj Vijay Dy. General Manager</p> <p>Encl: Duplicate LOA to be returned after acknowledgement</p> <p style="text-align: center;"></p> <p style="text-align: center;"><i>Connecting People Through quality infrastructure</i></p>	

Annexure 7: Provisional Certificate



SAI/SAGAR/MPRDC-II/2012/323

Date- 30-11-2012

PROVISIONAL CERTIFICATE

1. I, SAI Consulting Engineers Pvt. Ltd. acting as Independent Engineer, under and in accordance with the Concession Agreement dated 09.09.2011 (the "Agreement") for development of the Silwani – Sultanganj – Jaisinghnagar – Sagar Road Homogeneous Section – I (Silwani km 00 to Sultanganj km 30.00) of State Highway No. 15 (the "Project Highway") on design, build, finance, operate and transfer (DBFOT) on Toll Plus Annuity basis, through DBL Silwani – Sultanganj Tollways Ltd. Bhopal (M.P.), 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 are found incomplete and/or deficient have been specified in the Punch List appended hereto, and the Concessionaire has agreed and accepted that it shall complete and/or rectify all such works in the time and manner set forth in the Agreement. (Some of the incomplete works have been delayed as a result of reasons attributable to the MPRDC or due to Force Majeure and the Provisional Certificate cannot be withheld on this account. Through the remaining incomplete works have been delayed as a result of reason attributable to the concessionaire) I am satisfied that having regard to the nature and extent of such incomplete works, it would not be prudent to withhold commercial operation of the Project Highway pending completion thereof.
3. In view of the foregoing, I am satisfied that the 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 30th day of November 2012.

ACCEPTED, SIGNED,
SEALED AND DELIVERED
For and on behalf of
CONCESSIONAIRE by:



(Signature)
(Mr. Nitin Srivastava)
(Asst. General Manager)
(E-5/99, Arera Colony,
Bhopal – 462 016
Tel 0755 2461064/4290643)

SIGNED, SEALED AND
DELIVERED
For and on behalf of
INDEPENDENT ENGINEER by:



(Signature) Leader
(Mr. Darshan Mathur)
(Team Leader)
(House No. 1896,
Shivsthal, Makronia,
Sagar (M.P.) 470002)



SAI/SAGAR/MPRDC-II/2013/451

Date- 25-03-2013

PROVISIONAL CERTIFICATE

1. I, SAI Consulting Engineers Pvt. Ltd. acting as Independent Engineer, under and in accordance with the Concession Agreement dated 09.09.2011 (the "Agreement") for development of the Silwani – Sultanganj – Jaisinghnagar – Sagar Road Homogeneous Section – II (Sultanganj km 30 to Sagar km 75.995) of State Highway No. 15 (the "Project Highway") on design, build, finance, operate and transfer (DBFOT) on Toll Plus Annuity basis, through DBL Silwani – Sultanganj Tollways Ltd. Bhopal (M.P.), 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 are found incomplete and/or deficient have been specified in the Punch List appended hereto, and the Concessionaire has agreed and accepted that it shall complete and/or rectify all such works in the time and manner set forth in the Agreement. (Some of the incomplete works have been delayed as a result of reasons attributable to the MPRDC or due to Force Majeure and the Provisional Certificate cannot be withheld on this account. Through the remaining incomplete works have been delayed as a result of reason attributable to the concessionaire) I am satisfied that having regard to the nature and extent of such incomplete works, it would not be prudent to withhold commercial operation of the Project Highway pending completion thereof.
3. In view of the foregoing, I am satisfied that the 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 25th day of March 2013.

ACCEPTED, SIGNED,
SEALED AND DELIVERD
For and on behalf of
CONCESSIONAIRE by:



(Signature)
(Mr. Nitin Srivastava)
(Asst. General Manager)
(E-5/99, Arera Colony,
Bhopal – 462 016
Tel 0755 2461064/4290643)


SIGNED, SEALED AND
DELIVERED
For and on behalf of
INDEPENDENT ENGINEER by:



Team Leader
(Signature) SAI Consulting Engineers Pvt. Ltd.
(Mr. Darshan Mathur)
(Team Leader)
(House No. 1896,
Shivsthal, Makronia,
Sagar (M.P.) 470002)

Regd. Office: SAI House, Block-A, Satyam Corporate Square, B/h. Rajpath Club, Bodakdev, AHMEDABAD - 380 054 INDIA
Tel: +91-79-65142600/6514 2700 Fax: +91-79-65142800 E-mail: mail@saiindia.com Web: www.saiindia.com

Annexure 8: Completion Certificate

 **SAI Consulting Engineers Pvt. Ltd.**
An ISO 9001 Certified Company
Independent Engineer for Development of Package - II, MPRDC (3 Roads - Sehora, Silwani & Paron)
Team Leader Office: 1896, Shiv Shakti Makronia, SAGAR 470004, Madhya Pradesh, India
Ph. +91-7562 231305, Mob. : +91-98265-94994, E-mail: sagar@salinda.com, Web: www.salinda.com

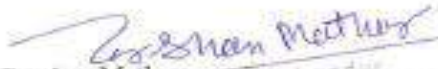
SAU/SAGAR/MPRDC-II/2013/427 Date- 28/02/2013

COMPLETION CERTIFICATE

1. I, SAI Consulting Engineers Pvt. Ltd. acting as Independent Engineer, under and in accordance with the Concession Agreement dated 09.09.2011 (the "Agreement") for two laning of the Silwani - Sultanganj - Jaisinghnagar - Sagar Road Homogeneous Section - I (Silwani km 00 to Sultanganj km 30.00) of State Highway No. 15 (the "Project Highway") on design, build, finance, operate and transfer (DBFOT) on Toll Plus Annuity basis, through DBL Silwani - Sultanganj Tollways Ltd. Bhopal (M.P.), hereby certify that the Tests specified in Article-14 and Schedule-I of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in commercial service of 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 28th day of Feb 2013.

SIGNED, SEALED AND DELIVERED

For and on behalf of
INDEPENDENT ENGINEER by:

Darshan Mathur Team Leader
Team Leader
House No. 1896, Shivshakti,
Makronia,
Sagar - 470002

Regd. Office: SAI House, Block-A, Satyam Corporate Square, B-9, Rajpath Club, Bodaldev, AHMEDABAD - 380 054 INDIA
Tel: +91-79-88142800, 6614 2700 Fax: +91-79-88142800 E-mail: mail@saikya.com Web: www.saikya.com



SAI Consulting Engineers Pvt. Ltd.

An ISO 9001 Certified Company
Independent Engineer for Development of Package – II, MPRDC (3Roads – Sehore, Silwani & Parga)
Team Leader Office: 1596, In front of Reserve Communication Office, Shiv Shakti Mahila, SAGAR 470004 Madhya Pradesh, India
Ph. +91-7582 231305, Mob. : +91-98263-94294, E-mail: sagar@salinda.com, Web: www.salinda.com

SAI/SAGAR/MPRDC-II/2013/488

Date- 29/05/2013

COMPLETION CERTIFICATE

1. I, SAI Consulting Engineers Pvt. Ltd. acting as Independent Engineer, under and in accordance with the Concession Agreement dated 09.09.2011 (the "Agreement") For two laning of the Silwani – Sultanganj – Jaisinghnagar – Sagar Road Homogeneous Section – II (Sultanganj km 30.00 to Sagar Km 75.995) of State Highway No. 15 (the "Project Highway") on design, build, finance, operate and transfer (DBFOT) on Toll Plus Annuity basis, through DBL Silwani – Sultanganj Tollways Ltd. Bhopal (M.P), hereby certify that the Tests specified in Article-14 and Schedule-I of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement, and I am satisfied that the Project Highway can be safely and reliably placed in commercial service of 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 29th day of May 2013.

SIGNED, SEALED AND DELIVERED

For and on behalf of

INDEPENDENT ENGINEER by:


Darshan Mathur
Team Leader
SAI Consulting Engineer Pvt Ltd
House No. 50, Parshav Pavilion,
Near Indus Empire,
Gulmohar Colony,
Bhopal – 462 039

Regd. Office: SAI House, Block-A, Satyam Corporate Square, B/H: Rajpath Club, Bodakdev, AHMEDABAD - 380 054 INDIA
Tel: +91-79-66142600, 6614 2700 Fax: +91-79-66142600 E-mail: mail@salinda.com Web: www.salinda.com

Annexure 9: Insurance

ELECTRONIC EQUIPMENT INSURANCE POLICY SCHEDULE

Signer: ATUL JERATH
Date: Fri, Nov 6, 2020 14:37:47 IST
Location: NOIDA
Reason: Signing Policy for OICL

Policy No : 171200/44/2021/40 **Prev Policy No** :
Cover Note No : ER1700203533 **Cover Note Dt** : 08/09/2020
Insured's Code : 114388343 **Issuing Office Code** : 171200
Insured's Name : DBL Silwani Sultanganj Tollways Ltd
(GSTIN: 23AAECD0389C1Z3) **Issuing Office Name** : CBU Vadodara (GSTIN: 24AAACT06)
Address : Plot No 5, Inside Govind Naryan Singh Gate,
Chuna Bhatti, Kolar Road, Bhopal,
Madhya Pradesh, 462016 **Address** : 1st FLOOR, KIRTI TOWER, TILAK
ROAD
VADODARA
GUJARAT 390001
Tel /Fax /Email : BHOPLA 462016 **Tel /Fax /Email** : 0265-2427075 / 0265-2436654 /
171200@orientalinsurance.co.in

Agent/Broker Details

Dev.Off.Code :
Agent/Broker : LC0000000179 (1149)UNISON INSURANCE BROKING SERVICES P LTD
Address : 001-002 ,5TH FLOOR AURAM NR VASNA,HP PETROL PUMP MARKAND DESAI RAOD
VADODARA 390015 GUJARAT INDIA,MOB NO 9898295111 PHONE NO 0265-
2252274,BARODA,GUJARAT,390007
Tel/Fax/Email : 0265-2252274/0265-2357445/0265-2356033/

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

Collection No & Dt : DC_I_INDCSH 3214000848 - 17/09/2020 **GST INVOICE NO** :2419487422 **UIN** :0
Gross Premium : 5,096 **GST** : 917 **Stamp Duty** : 1 **Total** : 6,013

RISK DETAILS

Section I : EEI - EQUIPMENT

Sum Insured : 1,01,88,667

1 **Location of the Risk** : AS PER LIST ATTACHED
Road and bridge stretch connecting from Silwani to
Sultanganj
MADHYA PRADESH - 464551

Sl No.	Description of Items	Manufacturer Name	Year of Annual Manufacture	Maintenance Contract	Identification No.	Escalation %	Sum Insured
1	AS PER LIST	AS PER LIST	2018		AS PER LIST		1,01,88,667

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

पॉलिसी अनुसूची / Policy Schedule - Civil Engineering Completed Risk

Policy Number:

321300441910001984

जारीकर्ता कार्यालय/Issuing Office

कार्यालय कोड /Office Code: 321300

कार्यालय पता /Office Address: BHOPAL
DIVISION II B-8, Indrapuri, B H E L, Bhopal,
Madhya Pradesh - 462022.

State Code: 23, Madhya Pradesh

GSTIN: 23AAACN9957E1ZB

Contact Number: 755 2682822

eMail: 321300@nic.co.in

Mobile Number:

व्यवसाय स्रोत /Business Source: 910355

वित्तिय चैनल कोड/Sales Channel Code:

9103550000001

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

सह दलाल कोड / Co Broker Code:

Customer Care Toll Free Number:
1800 345 0330

email:customer.support@nic.co.in

ग्राहक का नाम /Customer Name: DBL SILWANI SULTANGANJ

TOLLWAYS LTD.

पता / Address: PLOT NO. 5, INSIDE GOVIND NARAYAN SINGH
GATE, CHUNA BHATTI, KOLAR ROAD, BHOPAL (M.P)- 462016,
City: BHOPAL, District: BHOPAL, State: MADHYA PRADESH, PIN:
462016.

Cell: 9826292328

ग्राहक आईडी /Customer ID:

9701881833

पैन /PAN: AAECD0389C

फोन /Phone:

ई-मेल /E-Mail:

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

प्रीमियम/ Premium	₹ 11,50,358.00	कवर नोट संख्या और तारीख / Cover Note Number and Date	NA
CGST	₹ 1,03,532.00		
SGST/UTGST	₹ 1,03,532.00		
IGST	₹ 0.00		
केरला बाढ़ उपकर/Kerala Flood Cess	₹ 0.00	प्रस्ताव संख्या और तारीख / Proposal Number and Date	8800200327086399 Dt. 27/03/2020
कम: जीएसटी टीडीएस / Less: GST_TDS	₹ 0.00		
पुनर्प्राप्ति योग्य स्टाम्प ड्यूटी /Recoverable Stamp Duty	₹ 0.00	रसीद संख्या और तारीख / Receipt Number and Date	321300811910007666 Dt. 27/03/2020
कुल /Total Amount	₹ 13,57,422.00	पछिली पॉलिसी संख्या और समाप्ति तारीख / Previous Policy Number and Expiry Date	NA

(Rupees Thirteen Lakh Fifty Seven Thousand Four Hundred Twenty Two Only.)

Location: 2-Lane Road on Toll Plus Annuity Silwani-Sultanganj-Jaisinghnagar-Sagar Road section of State Highway No. 15, Madhya Pradesh
Raisen, Raisen, 464551.

Sr.No	Type of Risk	Description Of Risk	Earthquake Zone	Sum Insured of the risk(₹)	Excess(₹)
1	Roads	ROAD AND STRUCTURE Toll Building & Booths, TMS, HTMS, Office & It Equipment, Electronic	Zone III	1,05,25,00,000.00	1,00,000.00
2	Roads	Equipment, Road Furniture, Fixtures, Electrical Poles Lighting & Fittings, Signboard & Safety Barrier	Zone III	9,75,00,000.00	1,00,000.00

लागू खंडों, पुष्टीकरणों एवं वारंटियों / **Clauses, Endorsements and Warranties Applicable:** Policy is subject to following conditions : POLICY IS
SUBJECT TO THE FOLLOWING CONDITIONS:

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

Printed on 27/03/2020 by ID: 71671, AID: 71671

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HDFC ERGO General Insurance Company Limited



May 13, 2020

DBL SILWANI SULTANGANJ TOLLWAYS LTD

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



Dear Customer,

Sub: Employees Compensation Insurance Policy No: 3114203387794500000

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

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

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

Name of the Intermediary : GLOBAL INSURANCE BROKERS PVT LTD

Intermediary Code : 200113159601

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

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

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

Yours sincerely,

Authorised Signatory

3114203387794500000

Page 1 of 14

HDFC ERGO General Insurance Company Limited (Formerly HDFC General Insurance Limited)

UIN : IRDANI25P0017V02201112 | IRDAI Reg No.146 | CIN : U68030MH2007PLC177117

Registered & Corporate Office:
1st Floor, HDFC House, 185 - 186 Backbay Reclamation,
H. T. Parekh Marg, Churchgate, Mumbai - 400 020

Customer Service Address:
D-301, 3rd Floor, Eastern Business District (Magnet Mall),
LBS Marg, Bhandup (West), Mumbai - 400 078

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

HDFC ERGO General Insurance Company Limited

Certificate of Insurance cum Policy Schedule



Policy No. 3114203387794500000

Employees Compensation Insurance



Insured Name		DBL SILWANI SULTANGANJ TOLLWAYS LTD (PAN Number:AACCD6124B)			Business	OTHERS	
Correspondence Address		PLOT NO. 5, GOVIND NARAYAN SINGH GATE,CHUNA BHATTI, BHOPAL,BHOPAL,MADHYA PRADESH,462016.					
Mobile		Phone		E Mail		Policy Issuance Date	13/05/2020
Period of Insurance		From Date & Time		19/05/2020 00:01 AM		To Date & Time	
						18/05/2021 Midnight	

LAW

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

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

EC-13-0005

3114203387794500000

Page 2 of 14

HDFC ERGO General Insurance Company Limited (Formerly HDFC General Insurance Limited)

UIN : IRDAN125P0017V02201112 | IRDAI Reg No.146 | CIN : U68030MH2007PLC177117

Registered & Corporate Office:
1st Floor,HDFC House, 165 - 166 Backbay Reclamation,

Customer Service Address:
D-301, 3rd Floor, Eastern Business District (Magnet Mall),

Toll Free Number: 1800 2700 700
Telephone : +91 22 6638 3600 Fax: 91 22 6638 3699

Annexure 10: Change of Scope

	MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LIMITED (Govt. of M.P. Undertaking) 16-A, Anara Hills, Bhopal - 462 011 Tel.: (O) 0755-2765196, 205, 213, 216 (EPBX) Fax.: 91-755-2572643 Website : www.mprdc.nic.in.
No. /MPRDC/Silwani-Sagar/2014	
Bhopal, Date : 30/4/14	
To, Shri Darshan Mathur, Team Leader, Independent Engineer, M/s SAI Consulting Engineers Pvt. Ltd., 50 Parsh Pavalion Near Indus Empire, Gul Mohar Bhopal	
Sub :- Minutes of Meeting of Advisory committee of MPRDC for Change of Scope-Silwani-Sultanganj-Sagar Road (SH15) BOT (Toll+Annuity) Project	
Ref :- Your letter no SAI/SAGAR/MPRDC-II/2013/475 Date 02.05.2013.	
<p>Various items under Change of Scope-Silwani-Sultanganj-Sagar Road (SH15) BOT (Toll+Annuity) Project were recommended by Independent Engineer letter dated 02.5.2013. Above items were discussed by advisory committee in its meeting dated 03.06.2013. Advisory committee has made recommendations on each item as mentioned in minutes of meeting, which has been approved by Managing Director on Dated 26.03.2013. Please find enclosed minutes of meeting of advisory committee with the instruction to submit build drawings & as per provision of article 16 of concession agreement so that necessary action may be taken by this office as per provision of concession agreement.</p>	
Encl : As above	
Endt.No. /MPRDC/ Silwani-Sagar /2014	
Copy to : 1. General Manager (F) MPRDC Bhopal 2. Divisional Manager MPRDC Bhopal ✓ 3. Shri Nitin Shrivastava M/s DBL Silwani Sultanganj Tollways Ltd Bhopal	
Encl : As above	
 Chief Engineer (BOT) MPRDC, Bhopal	

SILWANI-SULTANGANJ-SAGAR ROAD PROJECT(SH-15) CHANGE OF SCOPE

Meeting of Advisory committee of MPRDC for Change of Scope for Silwani -Sultanganj- Sagar Road BOT(Toll plus annuity scheme) has been held in the office of MPRDC on 03.06.2013. Following Officers were present in the meeting:

- 1) Mr. A.S. Chendke, Technical Advisor, MPRDC, Bhopal
- 2) Mr. Anil Chansoria, Chief Engineer (BOT), MPRDC, Bhopal
- 3) Mr. Arun Pathwal, General Manager (Fin.), MPRDC, Bhopal
- 4) Mr. B.S. Meena, Divisional Manager, MPRDC, Bhopal
- 5) Mr. Darshan Mathur, Team Leader, Independent Engineer
- 6) Mr. Nitin Shrivastava Concessionaire Representative

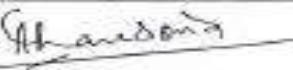
Change of Scope submitted by Independent Engineer vide its letter No. SAI/SAGAR/MPRDC-III/2013/475 dated 02.05.2013 have been discussed one by one and finalised as below:

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
1	HIGHWAY WORK					
1)	Built up area in Silwani between chainage 0+000 to 0+263.		Reconstruction of 7.0 m flexible pavement+ 1.5 m Paved shoulder (both side) + 1.0 m Granular shoulder (both side) with side drain in 0.6 km length between Chainage 0+000 to 0+600 in Built-up Section of Silwani town.	Existing rigid pavement 7.0m wide from Ch. 0 to 263 is in good condition, which is retained. Proposed 2.5 m both side widening with rigid pavement and side drain at km 0+000 to 0+263	The existing 7.0 m wide Rigid pavement is good in condition and as per site condition the requirement of 12.0 m wide rigid pavement is necessary due to Silwani urban area. Concessionaire has proposed the widening of existing rigid pavement by rigid pavement of 2.5 m both side in place of 1.5 m paved shoulder & 1.0 m granular shoulder. Hence negative change of scope is 7.0 m wide flexible pavement + 2x1.0m paved shoulder+2x1.0 Granular shoulder for 263 length and positive change of Scope for 2x2.5 Rigid Pavement in 263 m length.	Committee agreed with recommendation of IE to negative change of scope for 7.0 m wide flexible pavement + 2x1.5m paved shoulder+2x1.0 Granular shoulder for 263m length and positive change of Scope for 2x2.5 Rigid Pavement in 263 m length.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
2 STRUCTURE WORK						
A MINOR BRIDGE						
1)	10+500 (As per site 10+235)	Minor bridge 2x15m continuous span with over all width 8.4m, in good condition.	Widening of Minor Bridge at KM 10+500 of 2 span of 15 m (Total length 30m) to 12 m width	Retained the Minor Bridge at KM 10+235 of 2 span of 15 m (Total length 30m) with 8.4 m width as it is.	The location of minor bridge is situated in forest area and condition is good. The bridge is retained as per Clause 7.3.2 (i) of SP:73. Hence widening of 2 spans of 15m from 8.4 m to 12 m i.e. 3.6 m is Negative variation under change of scope.	Committee agreed with recommendation of IE to retain the minor bridge and widening of 2 spans of 15m from 8.4 m to 12 m i.e. 3.6 m as Negative variation under change of scope.
2)	28+900 (As per site 27+940)		Construction of new Minor Bridge at KM 28+900 with RCC Solid Slab of 2 span of 8 m (Total length 16 m) with 12 m width	Construction of new Hume Pipe Culvert of 2 x 1200 mm dia at KM 27+940 with 15 m width	As per site condition and topography, there was no defined nallah for which such larger minor bridge is required. Hence Minor bridge of size 2x8 m with 12m width is negative variation & Pipe culvert of size 2x1200 mm dia of with 15m width is positive variation.	Committee agreed with recommendation of IE for new construction of Minor Bridge of size 2x8m with 12m width as negative variation and pipe culvert of size 2x1200 mm dia with 15m with as positive variation under change of scope.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
B	BOX CULVERT					
1)	16+000 (As per site 14+603)	Stone masonry arch culvert of 1m span with overall width of 10.8m in poor condition.	Re construction with RCC Box Culvert at KM 15+000 of size 1x2 x 2 m with 12 m width	Re construction with Hume Pipe Culvert of 2 x 1200 mm dia at KM 14+603 having 12 m width	The location is situated in ghat section and reconstruction to box culvert was practically difficult due to space and forest constrain and as per hydraulic calculations 2x1200 mm dia pipe culvert will found sufficient. Hence Box culvert of size 1x2x2 with 12 m width is negative variation & Pipe culvert of 2x1200 mm dia having 12m width is positive variation.	Committee agreed with recommendation of IE for reconstruction of Box Culvert of Size 1x2x2 with 12m width as negative variation under change of scope and reconstruction of pipe culvert 2x1200mm dia with 12.5m width as positive variation under change of scope.
2)	75+080 (As per site 73+373)	Flush causeway of 39 m length.	Re construction with RCC Box Culvert at KM 75+080 of size 2x2 x 2 m with 12 m width	Re construction with Hume Pipe Culvert of 2 X 1200 mm dia at KM 73+373 having 15 m width.	As per site condition, such larger opening was not required, the pipe culvert proposed was adequate. Hence Box culvert of size 2x2x2 with 12 m width is negative variation & Pipe culvert of 2x1200dia having 15m width is positive variation.	Committee agreed with recommendation of IE for reconstruction of Box Culvert of Size 2x2x2 with 12m width as negative variation and reconstruction of pipe culvert 2x1200mm dia with 15m width as positive variation under change of scope.
3)	75+200 (As per site 73+736)	Flush causeway of 39 m length.	Re construction with RCC Box Culvert at KM 75+200 of size 2x2 x 2 m with 12 m width	Both side Widening of existing Hume Pipe Culvert of 2 x 900 mm dia at KM 73+736 from 12m to 17m Width.	In schedule 'A' existing FCW is mentioned while at site actual existing structure is 2X900 mm dia NP4 pipe culvert having 12 m width with good condition, which is sufficient to cater for discharge. Hence reconstruction by Box culvert of size 2x2x2 m with 12 m width is negative variation & widening of existing Pipe culvert 2x900 mm dia from 12m to 17 m width is positive variation.	Committee agreed with recommendation of IE for reconstruction of Box Culvert of Size 2x2x2 with 12m width as negative variation and widening of pipe culvert 2x900mm dia from 12m to 17m width as positive variation under change of scope.





Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
C PIPE CULVERT						
(I) RE-CONSTRUCTION INTO BOX CULVERT						
1)	53+300 (As per site 52+010)	Hume Pipe Culvert of 2x1000 mm dia with 12.5 m width	Retained	Re construction with RCC Box Culvert at KM 52+010 of Single cell of size 4 X 2.66 m with 12 m width	As per site condition and hydraulic assesment pipe culvert was not sufficient hence box culvert of size 1x4x2.66 is recommended. Hence reconstruction of box culvert in place of retained pipe culvert is Positive variation under change of scope	Committee agreed of with recommendation of IE for reconstruction of Box Culvert of size 1x4x2.66 in place of retained pipe culvert as positive variation under change of scope.
2)	53+800 (As per site 52+458)	Hume Pipe Culvert of 4x1000 mm dia with 12.5 m width	Retained	Re construction with RCC Box Culvert at KM 52+458 of Double cell of size 3 X 3.06 m with 12 m width	As per site condition and hydraulic assesment pipe culvert was not sufficient hence box culvert of size 2x3x3.06 is recommended. Hence reconstruction of box culvert in place of retained pipe culvert is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of Box Culvert of size 2x3x3.06 in place of retained pipe culvert as positive variation under change of scope.
(II) RE-CONSTRUCTION INTO HUME PIPE CULVERT						
1)	1+369	-	-	Reconstruction with Hume Pipe culvert of 1 X 1200 mm dia	The existing pipe culvert was settled and damaged hence reconstruction is recommended. Reconstructed Hume Pipe culvert of 1x1200 mm dia with 15 width is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 1x1200mm dia with 15m width as positive variation under change of scope.
2)	56+646	-	-	Reconstruction with Hume Pipe culvert of 1 X 1200 mm dia	Due to damage to the pipes observed, reconstruction with 1x1200mm dia HPC is recommended. Reconstruction of Hume Pipe culvert of 1x1200 mm dia with 15 width is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 1x1200mm dia with 15m width as positive variation under change of scope.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
3)	62+200 (As per site 60+726)	Hume Pipe Culvert of 1x1000 mm dia. with 12.5 m width	Retained	Reconstruction with Hume Pipe culvert of 2 X 1200 mm dia at Km 60+726.	The condition of culvert was poor (i.e. few pipes were damaged and sagging in barrel observed), more over local inquiry revealed the over topping of present culvert. Hence reconstruction with increased capacity HPC of size 2x1200 mm dia with 15m width is recommended. Reconstruction of pipe culvert in place of retained pipe culvert is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 2x1200mm dia with 15m width as positive variation under change of scope.
4)	74+500 (As per site 73+195)	Hume Pipe Culvert of 1x1000 mm dia. with 12.5 m width.	Retained	Re construction with Hume Pipe culvert of 1 X 1200 mm dia at KM 73+195 with 12.5 m width	The pipes were found damaged and no head walls were provided. Hence reconstruction of pipe culvert of size 1x1200 mm dia with 12.5m width in place of retained pipe culvert recommended which is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 1x1200mm dia with 12.5m width as positive variation under change of scope.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
5)	74+700 (As per site 73+255)	Hume Pipe Culvert of 2x1200 mm dia with 12.5 m width.	Retained	Re construction with Hume Pipe culvert of 1 X 1200 mm dia at KM 73+255 with 12.5 m width	At site existing structure was HPC of 1x1000 mm dia, the pipes were damaged and no head walls were provided hence reconstruction is recommended. Reconstruction of pipe culvert of size 1x1200 mm dia 12.5m width in place of retained pipe culvert recommended which is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 1x1200mm dia with 12.5m width as positive variation under change of scope.
6)	75+480 (As per site 73+514)	Hume Pipe Culvert of 1x1000 mm dia with 12.5 m width.	Retained	Re construction with Hume Pipe culvert of 2 X 1200 mm dia at KM 73+514 with 15 m width	In Schedule A 1 X 1000 dia pipe culvert is indicated but on site FCW was available which could be replaced with 2 X 1200 dia Pipe Culvert. Reconstruction of pipe culvert of size 2x1200 mm dia 15m width in place of FCW is Positive variation under change of scope	Committee agreed with recommendation of IE for reconstruction of pipe culvert 2x1200mm dia with 15m width as positive variation under change of scope.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
(III)	WIDENING					
1a	10+334	-	-	Both side Widening with Hume Pipe culvert from 10m to 15m.	Though the structure was not included in Schedule A or B but a site HPC of 900mm with 10.0 width is in existence, due to raising of FRL/change in alignment the present barrel length was not enough as per X-sectional requirement, the existing pipes were found in good condition, hence widening of 5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m of 1 No of Pipe Culverts as positive variation under change of Scope
1b	43+558 (12.5m), 63+200 (12.5m), 85+442 (10m), 68+248 (12.5m), 75+232 (12.5m)	-	-	One side/Both side Widening with Hume Pipe culvert : 43+558 (17.5m), 63+200 (17.5m), 85+442 (15m), 68+248 (15.5m), 75+232 (17.5m)	Though the structure was not included in Schedule A or B but at site HPC of 1000mm with 10.0 to 12.5m width is in existence, due to raising of FRL/change in alignment the present barrel length was not enough as per X-sectional requirement, the existing pipes were found in good condition, hence 5m widening for 5 Nos. is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening for 5m of 5 Nos of Pipe Culverts as positive variation under change of Scope

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
1c	65+140	-	-	One side Widening with Hume Pipe culvert from 12.5 to 15m.	Though the structure was not included in Schedule A or B but at site HPC of 1200mm with 12.5m width is in existence, due to raising of FRL/change in alignment the present barrel length was not enough as per X-sectional requirement, the existing pipes were found in good condition, hence widening for 2.5m is recommended. Widening is Positive variation under change of scope.	Committee agreed with recommendation of IE for widening for 2.5m of 1 No of Pipe Culverts as positive variation under change of Scope.
2a	32+300(31+526), 38+500(37+616), 38+900(37+899), 66+450(64+874), 67+100(65+280), 67+800(66+002)	Hume Pipe culverts 1 row with 1000 mm dia. With 10.0 m width.	Retained	One side/Both side Widening with Hume Pipe culvert, 32+300-15m, 38+500-12.5m, 38+900-12.5m, 66+450-15m, 67+100-15m, 67+800-15m	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening for 5 m for 4 Nos and 2.5m for 2 Nos HPC is recommended. Widening is Positive variation under change of scope.	Committee agreed with recommendation of IE for widening for 5 m for 4 Nos and 2.5m for 2 Nos HPC as positive variation under change of Scope.
2b	31+700(30+857), 48+200(47+291), 63+250(61+673), 63+600(62+038)	Hume Pipe culverts 1 row with 1000 mm dia. With 12.0 m width.	Retained	One side/Both side Widening with Hume Pipe culvert from 12m to 17m.	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening for 5m of 4 Nos HPC is recommended. Widening is Positive variation under change of scope.	Committee agreed with recommendation of IE for widening for 5m of 4 Nos HPC as positive variation under change of Scope.

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
2c	28+200(28+423), 29+500(29+174), 37+600(36+888), 37+900(36+975), 41+800(40+603), 41+900(40+894), 45+600(44+432)	Hume Pipe culverts 1 row with 1000 mm dia. With 12.5 m width.	Retained	One side/Both side Widening with Hume Pipe culvert from 12.5m to 17.5m.	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m for 7 Nos HPC is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m for 7 Nos HPC as positive variation under change of Scope
3a	67+500(65+870), 75+600(74+068)	Hume Pipe culverts 2 rows with 1000 mm dia. With 10.0m width	Retained	One side/Both side Widening with Hume Pipe culvert from 10m to 15m .	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m for 2 Nos HPC is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m for 2 Nos HPC as positive variation under change of Scope
3b	36+800(34+994), 36+500(35+545), 43+400(42+337), 45+850(44+681)	Hume Pipe culverts 2 rows with 1000 mm dia. With 12.5m width	Retained	One side/Both side Widening with Hume Pipe culvert . 35+900(17.5m), 36+500(17.5m), 43+400(20m), 45+850(20m)	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m for 2 Nos HPC and 7.5m of 2 Nos HPC is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m for 2 Nos HPC and 7.5m of 2 Nos HPC as positive variation under change of Scope

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
4)	34+300(33+388)	Hume Pipe culverts 3 rows with 1000 mm dia. With 12.0 width	Retained	Both side Widening with Hume Pipe culvert from 12m to 17m..	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m of 1 No of Pipe Culverts as positive variation under change of Scope
5)	67+200(55+572)	Hume Pipe culverts 4 rows with 1000 mm dia. With 10.0 m width	Retained	Both side Widening with Hume Pipe culvert from 10 to 15m .	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m of 1 No of Pipe Culverts as positive variation under change of Scope
6)	31+000(30+155)	Hume Pipe culverts 1 row with 1200 mm dia. With 12.5m width	Retained	One side Widening with Hume Pipe culvert from 12.5m to 20.5m .	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 7.5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 7.5m of 1 No of Pipe Culverts as positive variation under change of Scope
7)	28+400(27+661)	Hume Pipe culverts 2 rows with 1200 mm dia. With 12.5m width	Retained	One side Widening with Hume Pipe culvert from 12.5m to 17.5m.	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m of 1 No of Pipe Culverts as positive variation under change of Scope

Sr. No.	Chainage	Existing Detail as per Schedule A	Development Proposal as per Schedule "B"	Proposal of Concessionaire as per site condition	Reasons and Recommendation by Independent Engineer	Decision of Committee
8)	22+300(21+720)	Hume Pipe culverts 3 rows with 1200 mm dia. With 12.5m width	Retained	One side Widening with Hume Pipe culvert from 12.5m to 17.5m.	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 5m of 1 No of Pipe Culverts as positive variation under change of Scope
9)	22+700(22+131)	Hume Pipe culverts 5 rows with 1200 mm dia. With 12.5m width	Retained	One side Widening with Hume Pipe culvert from 12.5m to 20m.	Though the structures were proposed to be retained in Schedule B but due to raising in FRL /Shifting of alignment the barrel lengths were not enough as per X-sectional requirement hence widening of 7.5m is recommended. Widening is Positive variation under change of scope	Committee agreed with recommendation of IE for widening of 7.5m of 1 No of Pipe Culverts as positive variation under change of Scope


N.R. Shrivastava
Concessionaire Representative


Genshan Mathur
Team Leader


Divisional Manager
MPRDC Bhopal


General Manager (Fin.)
MPRDC Bhopal


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Annexure 11: Project Photos

