



**BIHAR STATE ROAD DEVELOPMENT CORPORATION
LIMITED**

(A Govt. of Bihar Undertaking)

ROAD & HIGHWAY WORKS

SCHEDULES FOR

**Improvement/Upgradation, Widening and Strengthening of Fungo
Halt-Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi-Chaughara
Road (SH-95) from KM 14+125 to KM 28+080 (Section-II) on**

EPC Mode

VOLUME II - BID DOCUMENTS

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LIMITED**

**Bihar State Road Development Corporation Ltd.,
(A Govt. of Bihar Undertaking),
RCD Mech. Workshop Campus, Sheikhpura,
Patna - 800 014, BIHAR**

April, 2023

**Improvement/Upgradation, Widening and Strengthening of Fungo
Halt-Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi-
Chaughara Road (SH-95) from KM 14+125 to KM 28+080 (Section-II)
on EPC Mode**

Schedules

(A to T)

**Section-II (Fungo Halt to Simri Bakhtiyarpur Section)
(Km 14+125 to Km 28+080)**

SCHEDULE - A

(See Clauses 2.1 and 8.1)

SITE OF THE PROJECT

1 The Site

- a. Site of the Single / Intermediate Project Highway shall include the land, buildings, structures and road works as described in Annex-I of this Schedule-A.
- b. The dates of handing over the Right of Way to the Contractor are specified in Annex-II of this Schedule-A.
- c. An inventory of the Site including the land, buildings, structures, road works, trees and any other immovable property on, or attached to, the Site shall be prepared jointly by the Authority Representative and the Contractor, and such inventory shall form part of the memorandum referred to in Clause 8.2(i) of this Agreement.
- d. The alignment plans of the Project Highways are specified in Annex-III. In the case of section where no modification in the existing alignment of the project highway is contemplated, the alignment plan has not been provided. The alignment plans have only been given for sections where the existing alignment is proposed to be upgraded. The proposed profile of the project highways shall be followed by the Contractor with minimum FRL as indicated in the alignment plan. The Contractor shall however improve/upgrade the Road Profile as indicated in Annexure-III based on site/design requirement.
- e. The status of the environment clearances obtained or awaited is given in Annex IV.

Annex - I

(Schedule-A)

Site of the Project

[Note: Through suitable drawings and description in words, the land, buildings, structures and road works comprising the site shall be specified briefly but precisely in this Annex-I. All the chainages / location referred to in Annex-I to Schedule-A shall be design chainage.]

1 Site

The Project road starts from the T-junction at km 14+125 of SH-95 at Fungo Halt and ends at Km.28+080 at Simri Bakhtiyarpur (NH-107). The proposed road stretch is a part of State Highway 95, crosses railway line at one location (Gorgama Dala Chowk). The details of site are described below.

Sr. No.	Type of Existing segment	Existing Chainage		Design Chainage		Length (Km)	Remarks
		Start	End	Start	End		
1	Existing Road/ Alignment	16+469	31+538	14+125	28+080	13.955	Starts from Fungo Halt and ends at Simri Bakhtiyarpur
	Total					13.955	

2 Land

The Site of the Project Highway comprises the land as described below:

Project Road:-

Sr. No.	Chainage		Width of ROW (in meters)	Remark
	From	To		
1	14+125	28+080	20-32	Existing Road

Note: The land already in possession and land to be possessed as per the requirement of TCS.

3 Carriageway

The existing road of the Project stretch is Single / Intermediate lanes. The type of the existing pavement is flexible.

4 Major Bridges

The project site includes following Major Bridges:

Sr. No.	Chainage	Type of Structure			No. of spans with span length (m)	Width (m)
		Foundation	Sub-structure	Super-structure		
Nil						

5 Road Over-Bridges (ROB)/ Road Under-Bridges (RUB)

The site includes the following ROB (Road Over Bridge)/RUB (Road under Bridge):

Sr. No.	Chainage	Type of Structure		No. of spans with span length (m)	Width (m)	ROB/ RUB
		Foundation	Super-structure			
Nil						

6 Grade Separators (VUP/Flyover)

The Site includes the following grade separators (VUP/Flyover):

Sr. No.	Chainage	Type of Structure		No. of spans with span length (m)	Width (m)
		Foundation	Super-structure		
Nil					

7 Minor Bridges

The Site includes the following minor bridges:

Sr. No.	Existing Chainage (km)	Type of Structure			No. of Spans x Span Length (m)	Over all Width (m)
		Foundation	Sub-Structure	Super Structure		
1.	18+235	-	-	-	2 x 10.3	8.4
2.	18+912	-	-	-	1 x 10.4	8.3
3.	19+484	-	-	-	1 x 10.4	8.3
4.	19+972	-	-	-	2 x 10.3	8.4
5.	20+164	-	-	-	2 x 10.3	8.4
6.	20+804	-	-	-	3 x 21.7	8.4
7.	21+817	-	-	-	2 x 10.8	8.4
8.	21+997	-	-	-	2 x 16.6	8.25
9.	23+459	-	-	-	-	-
10.	24+269	-	-	-	2 x 5	5.0
11.	24+736	-	-	-	1 x 9.2	4.1
12.	25+162	-	-	-	2 x 4.2	5.0
13.	29+637	-	-	-	1 x 14.11	12.0

8 Railway Level Crossings

The Site includes following railway level crossings.

Sr. No.	Location (km)	Remark
1	23+448 (Gorgama Dala Chowk)	Single Track

9 Underpasses/Overpasses (Vehicular, Non Vehicular)

The site includes the following underpasses/overpasses:

Sr. No.	Chainage (Km.)	Type of Structure	No. of spans with span length (m)	Width (m)
Nil				

10 Culverts

The Site has the following culverts:

Sr. No.	Existing Chainage (Km.)	Type of Culvert (Pipe, Slab, Box, Arch)	Span / opening with span length / pipe dia (m)	Overall Width (m)
1.	22+812	Pipe Culvert	3 x 0.6	11.03
2.	23+126	Pipe Culvert	2 x 0.6	11.10
3.	23+189	Pipe Culvert	2 x 0.6	5.00
4.	25+227	Pipe Culvert	2 x 0.6	-
5.	26+145	Slab Culvert	3 x 1.5	7.40
6.	26+969	Slab Culvert	3 x 1.5	6.70
7.	26+992	Slab Culvert	3 x 1.5	7.40
8.	27+137	Slab Culvert	3 x 1.5	7.80
9.	27+504	Slab Culvert	3 x 1.5	7.40
10.	28+552	Slab Culvert	3 x 1.5	7.40
11.	29+172	Slab Culvert	1 x 0.6	-
12.	29+568	Box Culvert	1 x 1	-
13.	32+299	Slab Culvert	2 x 1.5	7.40

11 Bus Bays / Bus Shelter

The details of bus bays on the site are as follows:

Sl. No	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

12 Truck Lay Bys

The details of truck lay bys on the site are as follows:

Sl. No	Chainage (km)	Length (m)	Left Hand Side	Right Hand Side
Nil				

13 Road Side Drains

The details of the roadside drains are as follows:

Sl. No.	Location		Length (km)	Side	Type	
	From Km.	To Km.			Masonry/CC (Pucca)	Earthen (Kutchha)
Nil						

14 Major Junctions

The details of major junctions are as follows:

Sl. No	Existing Chainage (Location)	Type of Junction (+,T,Y)	At- Grade	Separated	Category of Cross Road			
					NH	SH	MDR	Others
1	20+144 Kopariya Village	+						ODR
2	22+074 Matha Chowk	+						ODR
3	29+509 Simri Bakhtiyarpur	T			NH-107			

(NH: National Highway, SH: State Highway, MDR: Major District Road)

15 Minor Junctions

The details of minor junctions are as follows:

Sl. No	Existing Chainage	Type of Junction (+,T,Y)	Cross-Road
1	19+519	T	Kopariya Village
2	19+752	T	Kopariya Village
3	22+104	T	Khalkhda
4	23+424	T	Salkhua
5	23+574	T	Salkhua
6	23+804	+	Mubarak Pur
7	25+724	T	Gorgama Dala Chowk
8	25+844	T	Gorgama Dala Chowk
9	26+344	T	Fenha Village
10	26+502	Y	Fenha Village
11	26+514	Y	Fenha Village
12	27+374	T	Goriyari Village
13	27+704	T	Shanti Chowk
14	28+014	T	Shanti Chowk
15	28+099	T	Shanti Chowk
16	28+319	+	Shanti Chowk
17	28+474	Y	Shanti Chowk
18	28+832	T	Gorgama Dala Chowk
19	29+037	T	Gorgama Dala Chowk
20	29+066	T	Gorgama Dala Chowk
21	29+129	T	Gorgama Dala Chowk
22	29+244	T	Gorgama Dala Chowk
23	30+009	Y	Simri Bakhtiyarpur

16 Bypasses

The details of the existing road sections proposed to be bypassed are as follows:

Sl. No.	Name of bypass (town)	Chainage (km)		Length (in Km)
		From km to km		
Nil				

17 Service / Slip Road

The details of the slip/service roads are as follows:

Sl.No.	LHS			RHS		
	Chainage		length in meters	Chainage		length in meters
	from	to		from	to	
Nil						

Annex – II

(As per clause 8.3(i))

(Schedule-A)

Dates for providing Right of Way of Construction Zone

The dates on which the Authority shall provide Right of Way of Construction Zone to the Contractor on different stretches of the Site are stated below. The widening shall be accommodated within the available ROW except at locations of Junction Improvements, Re-alignment sections, ~~Truck lay byes, Toll Plaza/Rest areas~~ for which land shall be acquired within 180 days from the appointed date, as detailed in following tables.

(i) Full Right of Way (full width)

(ROW details for Rural Area Locations)

Sl. No.	Chainage		Length	Available ROW (m)	Dates of Providing Right of Way
	From	To			
1	16+469	16+789	0.320	20 to 32	Available at the time of handing over the site to the Contractor
2	16+789	17+044	0.255	20 to 32	
3	17+044	17+544	0.500	20 to 32	
4	17+544	18+394	0.850	20 to 32	
5	18+394	18+744	0.350	20 to 32	
6	18+744	19+994	1.250	20 to 32	
7	19+994	20+164	0.170	20 to 32	
8	20+164	20+694	0.530	20 to 32	
9	20+694	21+394	0.700	20 to 32	
10	21+394	24+344	2.950	20 to 32	
11	24+594	25+164	0.570	20 to 32	
12	25+164	25+374	0.210	20 to 32	
13	25+374	25+294	0.920	20 to 32	
14	26+494	26+744	0.250	20 to 32	
15	26+844	28+374	1.530	20 to 32	
16	28+374	28+744	0.370	20 to 32	
17	29+194	29+444	0.250	20 to 32	
18	29+444	30+424	0.980	20 to 32	

(ii) Full Right of Way**(ROW details for Urban Area Locations)**

Sl. No.	Chainage		Length	Available ROW (m)	Dates of Providing Right of Way
	From	To			
1	26+688	26+938	0.250	20 to 32	Available at the time of handing over the site to the Contractor
2	28+638	28+838	0.200	20 to 32	
3	29+088	29+188	0.100	20 to 32	
4	31+088	31+538	0.450	20 to 32	

(iii) Balance Right of Way (Width)**(ROW details for ROB Locations)**

Sl. No.	Design Chainage		Design Length(KM)	Proposed ROW	Dates of Providing Right of Way
	From	To			
1	23+030	23+950	0.920	25-30	180 days from the Appointed date

(ROW details for Re-alignments Locations)

Sl. No.	Design Chainage		Design Length(KM)	Proposed ROW (m)	Dates of Providing Right of Way
	From	To			
1	14+125	14+430	0.305	45	180 days from the Appointed date
2	27+050	28+080	0.580	25-30	Available at the time of handing over the site to the Contractor

Annex - III

(Schedule-A)

Alignment Plans

The existing alignment of the Project Highway shall be modified in the following sections as per the alignment plan indicated below:

- (i) The alignment of the Project Highway is enclosed in the alignment plan (Appendix B1-Drawings). Finished road level indicated in the alignment plan/Plan and Profile shall be followed by the contractor as minimum FRL. In any case, the finished road level of the project highway shall not be less than those indicated in alignment plan. The Contractor shall however, improve/ upgrade the Road profile as indicated in Annex-III based on site/ design requirement.

Annex – IV

(Schedule-A)

Environment Clearances

- As per notification no. S.O.2559 dt. 22.08.2013 of Ministry of Environment and forests, expansion of National Highway projects upto 100 Kms involving additional right of way or land acquisition upto 40 meter on existing alignments and 60 meter on re-alignment or by-passes may be exempted from the preview of the notification. Hence Environment clearance is not required for this project as project road length is less than 100 Km.

SCHEDULE - B

(See Clause 2.1)

Development of the Project Highway

1. Development of the Project Highway

Development of the Project Highway shall include design and construction of the Project Highway as described in this **Schedule-B** and in **Schedule-C**. The alignment plans of the Project Highway are specified in **Annex-III of Schedule A**. The proposed profile of the Project road shall be followed by the Contractor with minimum FRL as indicated in the alignment plan. The Contractor however, improve/upgrade the Road Profile as indicated in **Annex-III of Schedule A** based on site/design requirement.

2. Rehabilitation and augmentation

Improvement, Up-gradation, Widening and Strengthening of the road shall include Two-Lane with Paved Shoulder and widening/ reconstruction/new construction of the Project Highway with ROB as described in **Annex-I of this Schedule-B and Schedule-C**.

3. Specifications and Standards

The Project Highway shall be designed and constructed in conformity with the Specifications and Standards specified in **Annex-I of Schedule-D** with minimum provisions given in Schedule B and Schedule C w.r.t. the crust thickness.

Annex - I

(Schedule-B)

Description of Two Laning with Paved Shoulder

1. NEW CONSTRUCTION / IMPROVEMENT, UPGRADATION, WIDENING & STRENGTHENING OF EXISTING HIGHWAY WITH ROB.

1.1. The Project Road Section-II starts at Ch. 14+125 (Fungo Halt) and ends at Ch. 28+080 (Simri Bakhtiyarpur) and design length of project road is 13.955 km. The project highway shall be constructed as per Schedule B, C and D. The project Highway shall follow the existing alignment unless otherwise specified by the Authority and shown in the alignment plans specified in Annex-III of Schedule-A. Geometric deficiencies, if any, in the proposed horizontal and vertical profiles shall be corrected as per the prescribed standards for plain terrain to the extent land is available.

1.2. Width of Carriageway

1.2.1. Two-Laning with paved shoulders shall be undertaken. The paved carriageway shall be 10 m wide in accordance with the typical cross section drawings provided in the Schedules.

Provided that in the built-up areas the width of the carriageway shall be as specified in the following table:

Sl. No.	Built-up Stretch (Township)	Location (km)		Length (Km)	Typical Cross Section
		From	To		
1	Mubarak Pur	22+000	22+250	0.250	As per Typical Cross-Section of Schedule indicated in Appendix B-I (TCS-4) .
2	Fenha Village	23+950	24+150	0.200	
3	Mansuri Tola	24+400	24+500	0.100	
4	Ganj Village	26+400	26+840	0.440	
Total				0.99km	

1.2.2. Except as otherwise provided in this Agreement, the width of the paved carriageway and cross-sectional features shall conform to Manual.

2. GEOMETRIC DESIGN AND GENERAL FEATURES

2.1. General

Geometric design and general features of the Project Highway including structures, ROB, approaches, slip road & major/minor junction improvement shall be in accordance with the Alignment Plan provided by the Authority and in conformity with Section 2 of the Manual IRC SP: 73-2018 for 2 lane.

2.2. Design Speed

The design speed shall be the minimum design speed of 80 km/hr except in the stretches

specified in Schedule D & 2.3 of Schedule-B.

2.3. Improvement of the proposed road geometrics

In the sections where improvement of the proposed road geometrics to the prescribed standards is not possible, the proposed road geometrics shall be improved to the extent possible within given right of way and proper road signs and safety measures shall be provided.

In the following sections, curve improvements shall be carried out by Re-alignment as specified:

Sl. No.	Design Chainage (km)		Design Length (km)	Remarks
	From	To		
1	14+125	14+450	0.325	Fungo Halt

2.4. Right of Way

Details of the Right of Way are given in Annex II of Schedule-A.

2.5. Type of Shoulders

(a) In built-up sections, footpath/fully paved shoulder shall be provided in the following section:

Sl. No.	Stretch		Fully Pavement Quality Concrete/Footpaths	Reference to cross section
	From	To		
1	22+000	22+250	Paver Block & Drain-cum-Footpath	Cross sections attached with the schedule indicated in Appendix B-I will be referred
2	23+950	24+150	Paver Block & Drain-cum-Footpath	
3	24+400	24+500	Paver Block & Drain-cum-Footpath	
4	26+400	26+850	Paver Block & Drain-cum-Footpath	

(b) In open country, earthen shoulder of 1.0 m width shall be provided with 150 mm thick compacted layer of granular material.

(c) Design and specification of paved shoulders and granular material shall conform to the requirement specified in the Section 5 of Manual IRC SP: 73-2018.

(d) Paver Blocks shall be provided in stretch as per TCS & Designed in conforming to the Section Manual IRC SP: 63-2004.

2.6. Lateral and vertical clearances at underpasses

Lateral and vertical clearances at underpasses and provisions of guard rail/crash barriers shall be as per provisions of relevant manual and General Arrangement Drawings (GAD) given at **Appendix B1** of this schedule.

2.6.1. Lateral clearance: The width of the minimum opening at the underpasses shall be as follows:

Sl. No.	Design Chainage	Span/opening (m)	Remarks
Nil			

2.7. Lateral and vertical clearances at overpasses

2.7.1. Lateral and vertical clearances at overpasses shall be as per provision of relevant Manual.

2.7.2. Lateral clearance: The width of the opening at the overpasses shall be as follows:

Sl. No.	Design Chainage	Span/opening (m)	Remarks
Nil			

2.8. **Existing NH-107 Overlapping**

The existing overlapping section indicated below:

Sl. No.	Design Chainage (km)		Design Length (km)	Remarks
	From	To		
1	27+100	28+080	0.980	Existing Road NH 107

2.9. **Service/Slip Roads**

The service/slip roads of 3.75/5.5 m carriageway width shall be constructed at the following locations and for the length indicated below.

Sl. No.	Location of Service Road		Length (km) of service road	Remark
	From Km	To km		
1	23+030	23+950	0.920	Service road of 2 Lane P.O. location
Total Length			0.920	Both sides 1.840 km

2.10. **Grade Separated Structures**

2.10.1. Grade separated structures shall be provided as follows:

Sl. No.	Location (Chainage)		Span/opening (m)	Remarks
	From (km)	To (km)		
Nil				

2.10.2 In the case of grade separated structures, the type of structure and the level of the Project Highway and the cross roads shall be as per General Arrangement Drawing and the Plan and Profile Drawings attached.

2.11. **Cattle and pedestrian underpass /overpass**

Cattle and pedestrian underpass/ overpass shall be constructed as follows

Sl. No.	Design Chainage	Type of crossing
Nil		

2.12 **Typical cross-sections of the Project Highway**

The typical cross-sections of the Project Highway are given in **Appendix B-1 (Volume-III Drawings)** of this schedule. The chainage wise applicable typical cross section is provided in

table below:

Sl. No.	Chainage		Length (km)	TCS Type	Remark
	From Km	To km			
1	14+125	14+445	0+320	3	As per Typical Cross Sections
2	14+445	14+700	0+255	1	As per Typical Cross Sections
3	14+700	15+200	0+500	2	As per Typical Cross Sections
4	15+200	16+050	0+850	1	As per Typical Cross Sections
5	16+050	16+400	0+350	2	As per Typical Cross Sections
6	16+400	17+650	1+250	1	As per Typical Cross Sections
7	17+650	17+820	0+170	2	As per Typical Cross Sections
8	17+820	18+350	0+530	3	As per Typical Cross Sections
9	18+350	19+050	0+700	2	As per Typical Cross Sections
10	19+050	22+000	2+950	1	As per Typical Cross Sections
11	22+000	22+250	0+250	4	As per Typical Cross Sections
12	22+250	22+820	0+570	1	As per Typical Cross Sections
13	22+820	23+030	0+210	3	As per Typical Cross Sections
14	23+030	23+950	0+920	5	As per Typical Cross Sections
15	23+950	24+150	0+200	4	As per Typical Cross Sections
16	24+150	24+400	0+250	1	As per Typical Cross Sections
17	24+400	24+500	0+100	4	As per Typical Cross Sections
18	24+500	26+030	1+530	1	As per Typical Cross Sections
19	26+030	26+400	0+370	2	As per Typical Cross Sections
20	26+400	26+850	0+450	4	As per Typical Cross Sections
21	26+850	27+100	0+250	2	As per Typical Cross Sections
22	27+100	28+080	0+980	6	As per Typical Cross Sections

3. INTERSECTIONS AND GRADE SEPARATORS

All intersections and grade separators shall be as per the provision of relevant Manual. Existing intersections which are deficient shall be improved to the prescribed standards.

Properly designed intersections shall be provided at the locations and of the types and features given in the tables below:

(a) At-grade intersections

i) Major Intersection: The following major intersection needs to be improved as per manual.

Sl. No	Location of Intersection	Type of Intersection	Other features	Remarks
1	17+800	Four Leg	Major	Upgraded as per manual /Within Available ROW & As per Site Conditions
2	19+690	Four Leg	Major	
3	22+165	Four Leg	Major	
4	25+490	Four Leg	Major	
5	27+160	Three Leg	Major	
6	25+080	Four Leg	Major	

ii) Minor Intersection: The following minor intersection needs to be improved as per manual.

Sl. No	Location of Intersection	Type of Intersection	Other features	Remark
1	14+545	Three Leg	Minor	Upgraded as per manual /Within Available ROW & As per Site Conditions
2	16+395	Three Leg	Minor	
3	16+490	Three Leg	Minor	
4	16+790	Three Leg	Minor	
5	17+175	Three Leg	Minor	
6	17+408	Three Leg	Minor	
7	19+310	Three Leg	Minor	
8	19+760	Three Leg	Minor	
9	21+080	Three Leg	Minor	
10	21+230	Three Leg	Minor	
11	21+460	Four Leg	Minor	
12	22+665	Three Leg	Minor	
13	24+000	Four Leg	Minor	
14	24+158	Three Leg	Minor	
15	24+170	Three Leg	Minor	
16	24+340	Three Leg	Minor	
17	25+030	Three Leg	Minor	
18	25+360	Three Leg	Minor	
19	25+670	Three Leg	Minor	
20	25+755	Three Leg	Minor	
21	25+975	Four Leg	Minor	
22	26+130	Three Leg	Minor	

23	26+488	Three Leg	Minor	
24	26+690	Three Leg	Minor	
25	26+722	Three Leg	Minor	
26	26+785	Three Leg	Minor	
27	26+900	Three Leg	Minor	
28	27+665	Three Leg	Minor	

(b) Grade separated intersection with ramps

Sr. No.	Design Chainage	Salient features	Minimum length of viaduct to be provided	Road to be carried over/ under the structures
Nil				

(c) Grade separated intersection without ramps

Sr. No.	Design Chainage	Salient features	Minimum length of viaduct to be provided	Road to be carried over/ under the structures
Nil				

4. ROAD EMBANKMENT AND CUT SECTION

- 4.1. Improvement, Up-gradation, Widening and Strengthening of the existing road embankment/cuttings and construction of new road embankment/ cuttings shall conform to the Manual and the specified cross-sectional details. Deficiencies in the plan and profile of the existing road shall be corrected. Rising of the existing road shall be as per paragraph 4.2.1 of the Manual.

5. PAVEMENT DESIGN

- 5.1. Pavement design shall be carried out in accordance with Section 5 of the Manual. However minimum thickness and composition of pavement have been shown in typical cross sections.

5.2. Type of pavement

Type of Pavement shall be Flexible Pavement at all locations except in urban/habitation area where Rigid pavement is to be provided.

5.3. Design requirements

5.3.1 Design Period and strategy

Rigid pavement shall be designed for a minimum design period of 30 years as per IRC 58: 2015. Stage construction shall not be permitted.

Flexible Pavement shall be designed for a minimum period of 20 years as per IRC 37: 2019. Stage construction shall not be permitted.

5.3.2. Design Traffic

Notwithstanding anything to the contrary contained in this Agreement or the Manual, the Contractor shall design the pavement for design traffic of minimum 20 million standard axles (MSA) or as per the actual traffic whichever is higher for main carriageway and service/slip road. The minimum crust to be followed shall be as follows.

Minimum Pavement Thickness - Main Carriageway (at all widening/new pavement location)

Sr. No.	Description	Minimum crust composition of Flexible Pavement
1.	BC	40 mm
2.	DBM	95 mm
3.	WMM	250 mm
4.	GSB	230 mm
	Total	615 mm

Minimum Pavement Thickness – Main Carriageway (at all urban/habitation locations)

Sr. No.	Description	Minimum crust composition of Rigid Pavement
1.	PQC	300 mm
2.	DLC	150 mm
3.	GSB	150 mm
	Total	600 mm

Note: 1 :- Excavating and removal of entire loose/garbage/ filled up/ Marshy/mud/soft shale/ peat/unconsolidated soil (to a minimum depth of 300 mm or as required as per site condition) in entire width & disposed off beyond inhabitant area. Its disposal shall be the responsibility of the Contractor for all leads and lift. Excavated earth to be replaced and filled up to subgrade level with embankment quality of earth.

Note: 2 :- Existing Flexible / Concrete Pavement is to be dismantled and scarified to a depth of suitable strata as decided in consultation with Authority Engineer and its safe disposal beyond inhabitant area. Its disposal shall be the responsibility of the Contractor for all lead and lift.

6. ROADSIDE DRAINAGE

Drain cum Footpath shall be constructed on both sides of the project Highway throughout as per the typical cross sections attached and as per provision of relevant Manual. Roadside drain of RCC Box type capable of bearing load for service road / road connecting to project road shall also be provided in the stretches as shown in the typical cross sections. Best engineering practices shall be observed during excavation and construction of drain along ROW line which co-exists with buildup structure.

7. DESIGN OF STRUCTURES

7.1. General

7.1.1. All bridges, culverts and structures shall be designed and constructed in accordance with provision of relevant Manual latest IRC and MORTH standards prevalent, confirming to applicable earth quake zone & shall conform to the cross-sectional features and other details specified therein. The EPC Contractor shall get relevant approval of all bridges including ROB, GADs and detailed from the concerned Department.

7.1.2. Width of the carriageway of new bridges and structures shall be as follows and in accordance with the General Arrangement Drawings / Typical Cross Sections given at Appendix-B1 of this schedule:

Sl. No.	Bridge at km	Width of carriageway and cross section features
1	15+891	(Recently New constructed to be retained)
2	16+568	(Recently New constructed to be retained)
3	17+140	(Recently New constructed to be retained)
4	17+628	(Recently New constructed to be retained)
5	17+820	(Recently New constructed to be retained)
6	18+460	(Recently New constructed to be retained)
7	19+473	(Recently New constructed to be retained)
8	19+653	(Recently New constructed to be retained)
9	21+115	(Recently New constructed to be retained)
10	21+925	18m as per Manual
11	22+392	18m as per Manual
12	22+818	18m as per Manual
13	27+293	(Recently New constructed to be retained)

Note: - Span Arrangement of bridge and structures shall be designed by Contractor on the basis of detailed surveys & investigations subject to minimum specified in GAD as per **Appendix B1** of this schedule. Founding levels shall be decided after detailed Geo Technical Investigation. Water way, road top level, soffit etc. shall be decided on the basis of land survey conforming to various codal provision applicable.

7.1.3. The following structures shall be provided with footpaths –

Sl. No.	Location at Km.	Remarks
1	15+891	Retained
2	16+568	Retained
3	17+140	Retained
4	17+628	Retained

5	17+820	Retained
6	18+460	Retained
7	19+473	Retained
8	19+653	Retained
9	21+115	Retained
10	21+925	Reconstruction Minor Bridge
11	22+392	Reconstruction Minor Bridge
12	22+818	Reconstruction Minor Bridge
13	23+448	New ROB Bridge
14	27+293	Retained

7.1.4. Cross-section of the new culverts and bridges at deck level for the Project Highway shall conform to the General Arrangement Drawings given at Appendix B1 of this schedule, Typical Cross Sections given in the Manual and deviations given at Schedule D.

7.2. Culverts

7.2.1. Overall width of all culverts shall be equal to the roadway width of the approaches.

7.2.2. Reconstruction of existing Culverts

The existing culverts at the following locations shall be re-constructed as new culverts:

Sl. No.	Design Ch.	Culverts	Recommendation	Existing Span	Proposed span (m)
1	20+481	HP	Reconstruction	3*0.60	2x1.2
2	20+794	HP	Reconstruction	2*0.60	1x1.2
3	20+847	HP	Reconstruction	2*0.60	1x1.2
4	22+893	HP	Reconstruction	2*0.60	1x1.2
5	23+808	RCC Box	Reconstruction	3*1.50	1x5.0
6	24+637	RCC Box	Reconstruction	3*1.50	1x5.0
7	24+660	RCC Box	Reconstruction	3*1.50	1x5.0
8	24+806	RCC Box	Reconstruction	3*1.50	1x5.0
9	25+170	RCC Box	Reconstruction	3*1.50	1x5.0
10	26+217	RCC Box	Reconstruction	3*1.50	1x5.0
11	26+837	RCC Box	Reconstruction	1*0.60	1x2.0
12	27+259	RCC Box	Reconstruction	1*1.00	1x2.0

7.2.3. Widening of existing culverts:

All existing culverts which are not to be reconstructed shall be widened to the roadway width of the Project as per typical cross section given in the provision of relevant manual. Repairs and strengthening of existing structure where required shall be carried out.

Sl. No.	Design Ch.	Culverts	Recommendation	Existing Span	Proposed span (m)
Nil					

7.2.4. New Box Culverts shall be constructed as per particulars given in the table below:-

Sl. No.	Proposed Design Chainage	Proposed Span Arrangement (size)	Clear Width a (mm)	Clear Ht. b(mm)	Top Slab c (mm)	Bottom Slab d (mm)	Wall e (mm)	Proposed Structure Type	Remark
1	14+700	1x2	2000	2000	200	250	200	Rcc Box	New Construction
2	15+300	1x2	2000	2000	200	250	200	Rcc Box	New Construction
3	16+200	1x2	2000	2000	200	250	200	Rcc Box	New Construction
4	18+900	1x2	2000	2000	200	250	200	Rcc Box	New Construction
5	21+700	1x2	2000	2000	200	250	200	Rcc Box	New Construction
6	25+600	1x2	2000	2000	200	250	200	Rcc Box	New Construction
7	27+800	1x2	2000	2000	200	250	200	Rcc Box	New Construction

Note: These locations of culverts are tentative, exact number & location may be finalized in consultation with Authority Engineer/Authority.

7.2.5. Repairs/replacements of railing/parapets, flooring and protection works of the existing culverts shall be undertaken as follows:

Sl. No.	Proposed Design Chainage	Type of Structure (Pipe, Slab, Box, Arch)	Span Arrangement and Total Vent way (No. x Length) (m)	Existing Width of structure	Type of repair required
Nil					

Note: Floor protection works shall be as specified in the relevant IRC Codes and Specifications.

7.3. Bridges

7.3.1. The existing bridges at the following locations shall be re-constructed as new structures as per the provisions of relevant Manual:

Sl. No.	Bridge Location (km)	Salient details of existing bridge	Adequacy or otherwise of the existing waterway, vertical clearance, etc	Remarks
1	21+925	2 x 5.0m	1x12.00	As per GADs indicated in Appendix B-I.
2	22+392	1 x 9.2m	1x20.00	
3	22+818	3 x 4.2m	1x11.00	

7.3.2. The existing bridges at the following locations shall be widened as per the provisions of relevant Manual

Sl. No.	Location (km)	Existing width (m)	Extent of widening (m)	Cross section at deck level for widening @
NIL				

7.3.3. Minor Bridge reconstruction:

New bridges at the following locations on the Project Highway shall be constructed. General Arrangement Drawings for the new bridges are given at **Appendix B1** of this schedule.

Sr. No	Design Chainage (km)	Existing Type	Proposed Type	Existing span arrangement (m)	Proposed Minimum Length & Proposed Minimum span arrangement (m)	Proposed minimum width (m)	Remark
1	21+925	-	Solid Slab	10 (2 x 5)	12 (1 x 12)	18	Minor Bridge
2	22+392	-	RCC T-Beam	9.2 (1 x 9.2)	20 (1 x 20)	18	Minor Bridge
3	22+818	-	Solid Slab	8.4 (2 x 4.2)	11 (1 x 11)	18	Minor Bridge

Note : 1) Where the Existing structures reconstructed as New Bridge at same place, dismantling of Existing Minor Bridge, Pipe culvert and box culvert shall be carried out with all lead and lifts. A temporary diversion works shall be constructed as per Fig. 9.25 of manual IRC SP 73-2015 and as per para 112 of standards and specifications of Indian Roads Congress (MORTH) Fifth Revision with adequate cross drainage structure and traffic safety and control devices. The diversions shall be maintained in satisfactory condition till such time they are required and as directed by the Authority Engineer **and till necessary bridge load test be conducted after successful completion of bridge.**

2) Length of the bridge / Span arrangement of Major and Minor Bridge are indicative. It shall be designed by contractor on the basis of detailed surveys & investigations subject to minimum specified in General Arrangement Drawings at **Appendix B1** of this schedule.

- 3) Bridges locations are tentative, final locations to be decided as per site conditions/ requirement and in consultation with Authority /Authority Engineer.

7.3.4. The railings of existing bridges shall be replaced by RCC crash barriers at the following locations:

Sl. No.	Location at km	Remarks
1	15+891	Railings of existing bridges shall be replaced by RCC crash
2	16+568	Railings of existing bridges shall be replaced by RCC crash
3	17+140	Railings of existing bridges shall be replaced by RCC crash
4	17+628	Railings of existing bridges shall be replaced by RCC crash
5	17+820	Railings of existing bridges shall be replaced by RCC crash
6	18+460	Railings of existing bridges shall be replaced by RCC crash
7	19+473	Railings of existing bridges shall be replaced by RCC crash
8	19+653	Railings of existing bridges shall be replaced by RCC crash
9	21+115	Railings of existing bridges shall be replaced by RCC crash
10	27+293	Railings of existing bridges shall be replaced by RCC crash

7.3.5. Repairs/replacements of railing/parapets of the existing bridges shall be undertaken as follows:

Sl. No.	Location at km	Remarks
Nil		

7.3.6. Drainage system for bridge decks

An effective drainage system for bridge decks shall be provided as specified in relevant Manual.

7.4. Rail-road bridges

7.4.1. Design, construction and detailing of ROB/PUB shall be as specified in relevant Manual.

7.4.2. Road over-bridges (road over rail)

Road over-bridges (road over rail) shall be provided at the following level crossings, as per GAD, being approved by Railway Authorities, Plan & Profile and TCS given at Appendix B1 of this schedule.

Sl. No.	Location of Level crossing (chainage km)	Proposed Minimum Length & Proposed Minimum span arrangement (m)	Proposed Type
1.	23+448	132.0 m (30+72+30)	Composite + Bow String + Composite

- Note :**
- 1) Where the new structure is to be constructed, a temporary diversion works shall be constructed as per relevant manual and MORTH specification with adequate cross drainage structure and traffic safety and control devices. The diversions shall be maintained in satisfactory condition till such time they are required and as directed by the Authority Engineer.
 - 2) Length of the road over bridge / span arrangement are indicative. It shall be designed by contractor on the basis of detailed surveys & investigations subject to minimum specified in General Arrangement Drawings at Appendix B1 of this schedule.
 - 3) No structure (Foundation & substructure) shall be constructed in the property line of Railway.

7.4.3. Road under-bridges

- i) Road under-bridges (road under railway line) shall be provided at the following level crossings, as per GAD, Plan & Profile and TCS attached and relevant Manual.

Sl. No.	Location of Level crossing (chainage km)	Length of bridge (m)
Nil		

7.5. Repairs and strengthening of bridges and structures

The existing bridges and structures to be repaired / strengthened, and the nature and extent of repairs /strengthening required are given below:

(i) Bridges

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
1	15+891	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority.
2	16+568	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
3	17+140	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority

4	17+628	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
5	17+820	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
6	18+460	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
7	19+473	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
8	19+653	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
9	21+115	Bearings, expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority
10	27+293	Expansion joints, honeycombing, wearing surface, exposed reinforcement, flooring and protection wall etc. shall be repaired. Removal of vegetation and clear the Linear waterway & as required for the safety of the structure/ as per direction of Authority Engineer/Authority.

(ii) ROB/RUB

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
		NIL

(iii) Overpass/underpass and other structure

Sl. No.	Location of bridge (km)	Nature and extent of repairs /strengthening to be carried out
		NIL

Note: -It is clarified that above repairing & strengthening measures are indicative and minimum specified. The condition survey of the existing structure shall be carried out by the contractor as per IRC 35, & Strengthening / repairing shall be carried out as per the requirement of site and as per instruction of Authority Engineer, for pier, abutment sub structure & super structure, replacement of bearings, expansion joints & wearing coat, providing crash barriers on bridge, painting & protection works etc. If any Increase in the specified above shall not constitute a change of scope.

7.6. **Grade separated structures – Nil.**

8. **TRAFFIC CONTROL DEVICES AND ROAD SAFETY WORKS**

8.1 Traffic control devices and road safety works shall be provided in accordance with Section 4 of the Manual of rectification.

8.2 Specifications of the reflective sheeting shall be provided in accordance with the Manual.

8.3 The minimum number of blinker signals and minimum length of various types of crash barriers are given below:

Sl. No.	Description	Length/numbers
1	New jersey crash barrier	Nil
2	W beam crash barrier	6000 m
3	Blinker Signals	2 Nos
4	Road Stud / Cat Eye	1629 nos
5	Solar Studs	240 nos.

Note: Location and number/length of crash barriers shall be finalized in consultation with Authority/ Authority Engineer.

9 **ROADSIDE FURNITURE**

9.1 Roadside furniture shall be provided in accordance with the provisions of the Manual.

9.2 Overhead traffic signs and Informatory signs:

Sizes of overhead traffic signs shall be as per relevant section of the manual.
The minimum number of various overhead traffic signs and informatory signs are given below:

Sl. No.	Description	Numbers
1	Informatory sign	26
2	Overhead sign	4 (Full width: 2 nos. & Cantilever: 2 nos.)

Note: Site survey done by the Contractor and size, location & Number of gantry/overhead/informatory traffic sign shall be finalized in consultation with Authority/ Authority Engineer and in accordance with the provisions of the Manual.

10 ROAD SAFETY DURING CONSTRUCTION

All precaution shall be taken for road user safety & Safety of works as per manual such as Bollard, tapes, has to be maintained by the contractor compulsory at side.

11 COMPULSORY AFFORESTATION/TRANSLOCATION OF TREES

The number of trees which are required to be cut/ translocated should be as per policy of Government of Bihar and as per Forest Conservation Act and the cutting of trees/translocation of tree shall be included in the Contractor scope.

12 HAZARDOUS LOCATIONS

The safety barriers shall also be provided at the following hazardous locations:

Sl. No.	Location stretch from (km) to (km)	LHS/RHS
As per typical cross section.		

Note – Location of hazardous location shall be finalized in Consultation with Authority/Authority Engineer and in accordance with the provisions of the Manual.

13 RAINWATER HARVESTING

As per Ministry of Environment and Forests Notification, New Delhi dated 14.01.1997 (as amended on 13.01.1998, 05.01.1999 & 6.11.2000), the construction of Rain water, harvesting structure is mandatory in and around Water Crisis area, notified by the Central Ground Water Board. So same shall be provided accordingly.

14 CHANGE OF SCOPE

The length of Structures and bridges specified hereinabove shall be treated as an approximate minimum assessment. The actual lengths as required on the basis of detailed investigations & survey shall be determined by the Contractor in accordance with the latest Specifications and Standards. Any variations in the lengths specified in this Schedule-B shall not constitute a Change of Scope, save and except any variations in the length arising out of a Change of Scope expressly undertaken in accordance with the provisions of Article 13.

Note: Length of drain $\pm 5\%$ as per Cross Section TCS & TCS will not be considered as change of Scope, Location of wayside amenities may be finalized in consultation with Authority Engineer/Authority.

APPENDIX B 1: TCS, P&P & Structure GADs

(Drawing Volume-III enclosed separately)

Section-II (KM 14+125 to KM 28+080)

(Fungo Halt-Simri Bakhtiyarpur Section)

Schedule B-1

The shifting of utilities and felling/translocation of trees shall be carried out by the Contractor. The cost of the same shall be borne by the Authority.

The details of structures are as follows: (tentative)

S/No.	Design Ch.	Type of STR	Road Side	Proposed Center Line distance (M)
1	17+375	Temple	LHS	15
2	17+380	School	LHS	25
3	23+990	School	LHS	8 (ROB End)
4	25+490	Temple	LHS	8.5
5	25+495	Temple	RHS	7.5
6	26+150	School	LHS	24
7	26+720	Temple	LHS	3
8	26+830	Temple	LHS	11

SCHEDULE - C

(See Clause 2.1)

PROJECT FACILITIES

1. PROJECT FACILITIES

The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

- a) Traffic control devices/ road safety devices/ Roadside furniture;
- b) Pedestrian facilities;
- c) Landscaping & Tree plantation;
- d) Bus Bays with Bus Shelter
- e) Truck lay-byes/ truck terminal/ wayside amenities
- f) Utility Pipe Duct across the road
- g) Street lighting and High Mast Light
- h) Traffic Aid post
- i) Medical Aid Posts
- j) Vehicle Rescue Posts

2. PROJECT FACILITIES FOR TWO LANING

Project Facilities forming part of Two-Laning with Paved Shoulder to be completed on or before the project completion date have been described in **Annex-I** of this **Schedule-C**.

ANNEX-I

(Schedule-C)

PROJECT FACILITIES

1 Project Facilities

The Contractor shall construct the Project Facilities in accordance with the provisions of this Agreement. Such Project Facilities shall include:

- a) Traffic control devices/ road safety devices/ Roadside furniture;
- b) Pedestrian facilities;
- c) Landscaping, Tree plantation & Translocation of Trees;
- d) Bus Bays with Bus Shelter
- e) wayside amenities
- f) Utility Pipe Duct across the road
- g) Street lighting and High Mast Light
- h) Traffic Aid post
- i) Medical Aid Posts
- j) Vehicle Rescue Posts

2 Description of Project Facilities

Each of the Project Facilities is described below:

a) **Traffic control devices/ road safety devices/ Roadside furniture**

The provision of traffic control devices/ road safety devices shall be made as per specifications and standards as specified in Schedule D and in consultation with the Authority Engineer/Authority.

The roadside furniture shall include the provision of the following:

- i. **Traffic Signs**
Traffic Signs includes the Road Side Signs, Overhead signs and Kerb mounted signs along the Project Highway as per Manual and Schedule B.
- ii. **Pavement Markings**
Pavement marking shall cover the road marking for the Project Highway as per Manual.
- iii. **Road Delineators**
Road Delineators shall be provided in accordance with the Manual. The minimum numbers of delineators are given below as minimum criteria in line with the manual:

Sl. No.	Unit (Numbers)
Delineators	564

- iv. Reflective Pavement Markers (Road Studs)
Road Studs shall be provided in accordance with the Manual.
- v. Boundary stones
Boundary Stones shall be provided in accordance with the relevant manual.
- vi. Hectometer/Kilometer Stone
Hectometer/km Stones shall be provided in accordance with relevant Manual.
- vii. Crash Barrier
 1. W - beam Type Crash Barrier shall be provided for a minimum length of 6000 m in accordance with the Manual and as per consultation by the Authority/Authority Engineer.
 2. Metallic Crash Barrier/Concrete Crash Barrier shall be provided for length of approach of ROB in accordance with the Manual and as per consultation by the Authority/Authority Engineer.

b) Pedestrian Facilities

Pedestrian Facilities include the provision of:

- i. Footpath (width as per typical cross section) shall be provided over proposed drains for entire length as per the Manual and as per consultation by the Authority/Authority Engineer.
- ii. Pedestrian Guard Rail (MS Grill) – Pedestrian Guard Rail/MS grill shall be provided at each bus stop location and as per consultation by the Authority/Authority Engineer.

c) Landscaping and Tree Plantation

This work will be done by Forest & Environmental Department, Government of Bihar.

d) Bus bays with bus shelters

Bus bays/bus shelters shall be provided as per specifications and standards given in Manual. The Contractor shall provide minimum 6 nos. Bus Bays along the project highway and the locations as given below:

Sl. No	Chainage	Side
1	14+615	LHS
2	14+800	RHS
3	22+110	LHS
4	22+210	RHS
5	26+315	LHS
6	26+330	RHS

Note: The locations of these bus bays shall be finalized by the Contractor in consultation with the Authority Engineer/Authority.

e) Truck Terminal/Wayside Amenities/Truck Lay Bys

The Truck Terminal / Wayside Amenities / Truck Lay-Bys shall be provided as per specifications and standards specified in Manual. However, suitable locations shall be decided in consultation with Authority Engineer/Authority.

f) Utility pipe ducts

Provision of accommodating utilities has been made over as well as underground within utility corridor on either side of the Project Highway with 300 mm across the road width at 1000 m spacing and also at suitable locations decided in consultation with Authority Engineer/Authority.

g) Street/highway Lighting

65 nos. of Single/Double Arm Street/highway lighting shall be provided in accordance with the Manual. Locations shall be as per requirement of the manual and as per the direction of Authority/Authority Engineer. Apart from the locations specified in the manual, High Mast Lighting shall be provided at the following tentative locations:

Sl. No.	Major junction Locations	Remarks
1	19+690	Mata Chowk
2	22+165	Mubarak Pur
3	25+490	Shanti Chowk
4	27+160	Simri Bakhtiyar Pur Old Market
5	28+080	End Of NH-107(Purani Bazar Bypass)
Sl. No.	Railway Level Crossing	Remarks
1	23+448	Gorgama Dala Chowk

Note: The EPC contractor has to operate and maintain the street lighting [Electrical system (including payment of Electricity bills or adopt Solar System) or adopt solar system] during defect Liability period including Maintenance period. After completion of defect Liability period including Maintenance period, the same shall be handed over to local body through BSRDC.

h) Traffic Aid Posts

Traffic aid posts shall be provided as per specifications and standards specified in Schedule D.

i) Medical Aid Posts

Medical Aid Posts shall be provided as per specifications and standards specified in Schedule D.

j) Vehicle Rescue Posts

Vehicle rescue posts shall be provided as per specifications and standards specified in Schedule D.

SCHEDULE - D

(See Clause 2.1)

SPECIFICATIONS AND STANDARDS

1 Construction

The Contractor shall comply with the Specifications and Standards set forth in Annex-I of this Schedule-D for construction of the Project Highway.

2 Design Standards

The Project Highway including Project Facilities shall conform to design requirements set out in the following documents:

- i) Manual of Specifications and Standards for Two Lane Highways IRC:SP:73-2018, referred to herein as the Manual.
- ii) Guidelines for the use of interlocking concrete block pavement IRC: SP:63-2004, referred for paver blocks.
- iii) Guidelines for the Design of Plain Jointed Rigid Pavements for Highways, IRC: 53-2015, referred for rigid pavement.
- iv) Guidelines for the Design of Flexible Pavements, IRC: 37-2019, referred for flexible pavement.
- v) Guidelines for load testing of bridges, IRC: SP: 51-2014, referred for bridge load test.

Annex - I

(Schedule-D)

Specifications and Standards for Construction

1 Specifications and Standards

All Materials, works and construction operations shall conform to the Manual of Specifications and Standards for Two Laning of Highways (IRC:SP:73-2018) and MORTH Specifications for Road and Bridge Works (5th Revision) issued by Ministry of Surface Transport (Roads wing), Govt. of India and published by Indian Roads Congress.. Where the specification for a work is not given, Good Industry Practice shall be adopted to the satisfaction of the Authority's Engineer.

2 Deviations from the Specifications and Standards

2.1 The terms "Concessionaire", "Independent Engineer" and "Concession Agreement" used in the Manual shall be deemed to be substituted by the terms "Contractor", "Authority's Engineer" and "Agreement" respectively.

2.2 Notwithstanding anything to the contrary contained in Paragraph 1 above, the following Specifications and Standards shall apply to the Project Highway, and for purposes of this Agreement, the aforesaid Specifications and Standards shall be deemed to be amended to the extent as per TCS provided in Schedule B and set forth below:

Sl. No	Item	Manual Clause Reference	Provision as per Manual	Modified Provision
1.	Right of Way	2.3	45-60 m	As mentioned in Annex II of Schedule A.
2.	Shoulder	2.6.1	Width of shoulder 2.5 m paved and 1.5 m earthen	As per TCS given in the Schedule B, to be followed.

1.3 The provisions given in schedule B and C of EPC Agreement shall supersede to Schedule D in case of any conflict.

2. Additional Specifications

Appendix D-1 Environmental Management Plan

Appendix D-2 Involuntary Resettlement Safeguard Principles for the Project.

Appendix D-1

Environmental Management Plan

1.1 Introduction

The project specific Environment Management plan has been formulated with an aim to avoid, reduce, mitigate, or compensate for adverse environmental impacts/risks and propose enhancement measures. This includes: (i) mitigation of potentially adverse impacts; (ii) monitoring of impacts and mitigation measures during project implementation and operation; (iii) institutional capacity building and training; (iv) compliance to statutory requirements; and (v) integration of EMP with Project planning, design, construction and operation.

The environmental management plan highlighting potential impacts, mitigation measures, legislative requirements, time frame and institutional responsibility are given in succeeding Table.

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ Sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
A. DESIGN AND PRE-CONSTRUCTION PHASE								
I. PRE-CONSTRUCTION ACTIVITIES BY PIU, BSRDCL								
1. Alignment/ Pavement Design/ Road Safety								
1.1 Alignment Design due considering risk of constricted sections, sharp curves, blind spot etc.	<ul style="list-style-type: none"> Proposed design adopted in accordance with the provisions of the IRC Codes Geometrical design standard features as follows Main Carriageway: Carriageway Width = 1x 7.0m or 12m for Urban (2-lane Flexible/ Rigid), Paved Shoulder = 2 X 1.5m Earthen/ Paver Block Shoulder Width = 2 x 1.0m or 2 x 2.5m Footpath cum Drain = 2x 2.5m (Built-up sections) Roadway Width= 12.0m 	As per applicable IRC standards and guidelines	<ul style="list-style-type: none"> Widening of whole section from Fungo Halt to Simri Bakhtiarpur with horizontal and vertical alignment improvements. 	MI: Design Parameters compliance to Guideline. PT: Designs are in accordance with site needs	Review of detailed design documents & drawings and comparison with site conditions	Covered under costs for DPR consultant	Design Consultant	BSRDCL
1.2 Pavement Design considering traffic load, pavement damage, overtopping etc.	<ul style="list-style-type: none"> Both Flexible and Rigid pavement has been proposed for the sub-project. Rigid pavement design is based on IRC: 58-2011 and design of flexible pavement is based on IRC 37-2012. Pavement Design life for cement concrete pavement has been performed for 30 years and 15 years for flexible pavements. Proposed cement concrete Pavement has been proposed for 0.99 km and Flexible Pavement has been proposed for the remaining sections. 40mm BC has been considered as surface course and 110mm DBM with VG-30 has been considered for Base/ binder course of Flexible pavement. Cement concrete pavement in built-up 	Design requirement. IRC: 37-2012, IRC: 58-2011, IRC: SP:73-2007, SP:84-2009	<ul style="list-style-type: none"> Rigid/ cement concrete pavement has been proposed in the heavily built-up stretch for 0.99 km (km 22.000 to km 22.250, km 23.950 to km 24.150, km 24.400 to km 24.500 and km 26.400 to km 26.840) Remaining section has been proposed with Flexible bituminous pavement. 	MI: Design Parameters compliance to Guideline. PT: Designs are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultant	Design Consultant	BSRDCL

Section-6: EMP

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	section with 300mm PQC, 150mm DLC, 150mm GSB and 500mm Sub-grade.							
1.3 Drainage provisions considering inundation, water logging, overtopping due to inadequate drainage provisions.	<ul style="list-style-type: none"> • Embankment height raised above HFL. • Roadside footpath cum line drains to avoid water logging in built-up-sections proposed with suitable outfalls. • Prevention of waterlogging and overtopping due to intensive rainfall. • Heavily built-up and geometrically deficit sections have been avoided. • Increased vent size of existing cross drainage structures having inadequate waterways to control flooding. • Provision of additional cross drainages structures like culverts, bridges etc. 	Design requirement IRC: SP: 19. IRC: 37-2012 IRC: SP:73 IRC-SP:50-1999.	<ul style="list-style-type: none"> • Lined drain of 1.980 km (km 22.000 to km 22.250, km 23.250 to km 24.150, km 24.400 to km 24.500 and km 26.400 to km 26.840). • Culverts- 8 Box is additionally proposed, 4 HPC is to be reconstructed. • Minor bridge – 3 nos. of new minor bridges are proposed km 21.925, km 22.392 and km 22.818 • 1 New ROB is proposed at km 23.448 	<p><u>MI</u>: Design and number of cross and side drains,</p> <p><u>PT</u>: Design and numbers of CDs are in accordance with site needs and no incidence of overloading</p>	Review of detail design documents & drawings and comparison with site conditions	Covered under costs for DPR consultant	Design Consultant	BSRDCL
1.4 Safety along the proposed alignment	<ul style="list-style-type: none"> • Geometric Improvement of curves • Provision of crash barriers at accident prone areas and bridges • Speed limitations near educational institutes, hospitals and other CPRs. • Provision of retro-reflective warning signboards near curves, school, hospital, religious places and other sensitive location • Provision of sidewalks in the built-up sections on covered drains • Signs and marking viz., delineators, object markers, hazard markers, safety barriers at hazardous locations, • Street Lighting in built-up sections and at major Junctions proposed • Major Junctions to be improved as per IRC/MORTH guidelines. 	Design requirement IRC: SP:73-IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MORTH Specifications Horizontal geometry will be based on IRC: 38-1988 and vertical	<ul style="list-style-type: none"> • Speed Regulatory signage, in built-up/ sensitive locations. • Street lighting in built-up sections and at major junctions proposed. • 6 major junctions are to be improved with appropriate signages. • 28 minor junctions are also to be improved at places village roads, ODRs meets the project road. • Total 5 Bus-bays proposed for both side of the project road. 	<p><u>MI</u>: number and location of crash barriers, informative and cautionary sign boards, service roads and Street lighting as per design</p> <p><u>PT</u>: numbers and location are in accordance with site needs :</p>	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultant	Design Consultant	BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
		geometry will be based on IRC: SP 23-1993 “. IRC: SP: 67-2012						
2. Natural Hazard/ Climate Change Risk								
2.1 Damage to pavement integrity like Rutting, embankment softening and migration of liquid asphalt. Thermal expansion in bridge expansion joints and paved surfaces	<ul style="list-style-type: none"> Asphalt binder specifications based on viscosity-grade specifications as per IS 73-2013 guidelines and IS 15462 2004 for rubber modified binder and polymer modified binders. 	IRC 37 2012 for flexible pavement design, IRC 81 1997 for strengthening of flexible pavement	Entire stretch	MI: Pavement Surface and bridge expansion joints during extreme heat PI: No softening, rutting, asphalt migration/thermal expansion of joint	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultant	Contractor	BSRDC
2.2 Earthquake	<ul style="list-style-type: none"> Relevant IS codes have been adopted in designing the structures to sustain the magnitude of earthquake corresponding to Seismic zone of the project area. 	Dislodgement of superstructure shall be taken as per Clause 222 of IRC: 6.	Entire Stretch	MI: Culverts, Bridges, PT: Design conforms BIS and IRC guidelines	Review of design documents and drawings and comparison with site conditions	Covered under costs for DPR consultant	Contractor	BSRDC
2.3 Local Flooding/ Water Logging	<ul style="list-style-type: none"> Roadside footpath cum lined drains to avoid water logging in built-up-sections proposed with suitable outfalls. Prevention of waterlogging and overtopping due to intensive rainfall. 	IRC:34 Recommendations for road construction	<ul style="list-style-type: none"> Roadside footpath cum drains (both sides together) = 1.980 km. Culverts- 8 Box is additionally 	MI: Design and numbers of cross & Side drains, design and	Review of design documents and drawings	Covered under costs for DPR consultant	Contractor	BSRDC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<ul style="list-style-type: none"> Cross drainage structures designed for 50-year return period Waterways of bridges and culverts have been increased. 	in waterlogged area and IRC: 75 and MORT&H guidelines for	proposed, 4 HF : is to be reconstructed. <ul style="list-style-type: none"> Minor bridge – 3 nos. of new minor bridges are proposed km 21.425, km 22.392 and km 22.313 New ROB is proposed at km 23.448 	number of bridges PT: Design and numbers are in accordance with site needs	and comparison with site conditions			
3. Loss of Land and Assets								
3.1 Livelihood loss to affected persons	<ul style="list-style-type: none"> Road improvement work to be accommodated within available ROW to the extent possible. Social Impact Assessment and Resettlement Plan to be undertaken as per national policy and ADB' guidelines. The acquisition of land and private properties shall be carried out in accordance with the RAP and entitlement framework of the Project. BSRDCL has to ascertain that acquisition of land in the post design phase are addressed and integrated into relevant contract documents. Complete all necessary land and property acquisition procedures prior to the commencement of civil work. Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework. Compensation and assistance as per project Resettlement Plan Implementation of Income restoration plan as per approved RP Preference in employment and petty contracts during construction to APs Constitute Grievance Redress 	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013 and ADB's involuntary resettlement policy. Contract Clause for preference to local people during employment.	<ul style="list-style-type: none"> Throughout the corridor (Pls. refer RP) 	MI: Payment of compensation and assistance to DPs as per entitlement matrix of RP Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.	Check LA records; design drawings vs. land plans; Interview with affected persons Check status of employment given to local people during construction	Part of administrative and resettlement costs	BSRDCL and implementing NGO	BSRDCL

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	Committee as per approved RP							
4. Diversion of Forest Land and Cutting of Trees								
4.1 Loss of forest flora/ Land use change/ deterioration in local climatic condition/ Increase in Green House effect	<ul style="list-style-type: none"> All efforts shall be made to preserve trees including evaluation of minor design adjustments/ alternatives (as applicable) to save trees. Specific attention shall be given for protecting oversize trees, green tunnels and locally important trees (religiously important etc.). Only the bare minimum trees to be felled from the total affected trees. All attempts shall be taken to suitably translocate the trees affected during construction as per the Tree translocation Plan. Obtaining NOC for felling of trees on Forest Land prior to commencement of construction activities¹ No Forest Diversion involved under Forest (Conservation) Act 1980. Tree felling is to proceed only after all the legal requirements including attaining of In-principle and Formal clearances from the Forest Dept. Particular species declared as "protected" by the State Forest Dept. in the private land shall be felled only after due clearance from the Forest Dept. Trees shall be removed from the Corridor of Impact before the actual commencement of the work after 	Forest Conservation Act, 1980 MoRTH 201.2 and 301.5	<ul style="list-style-type: none"> Total number of affected trees = 300² Translocation of trees³ = 	<p><u>MI:</u> location of geometric adjustments to minimize tree cutting, budget allocated for compensatory and additional plantation</p> <p><u>PT:</u> Unnecessary tree felling on forest land avoided. Budget allocation is adequate,</p>	Review final design. Check budget provision for compensatory and additional plantation.	Covered under costs for DPR consultants	BSRDCL, Design consultants forest department	BSRDCL/Forest department

¹ NOC shall be obtained based on Guidebook on application & inspection procedure for obtaining NOC/Transit Permit for Tree felling/transportation of Environment and Forest Dept, Govt. of Bihar.

² Figure mentioned is based on inventory prepared.

³ Translocation of Trees shall be carried out as per Officer Order of Environment, Forest and Climate Change Division, Govt. of Bihar vide No. Forest Land-39/2012-974/E/PVJP, Patna 15 dated 26/07/2019.

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>obtaining the permission from the state Forest Department. Tree felling shall not commence until the implementation of the project in that particular stretch is confirmed.</p> <ul style="list-style-type: none"> Stacking, transport and storage of the timber shall be done as per the relevant norms. Compensatory plantation (1:3) as per Bihar Government's Forest Department circular dated 28.01.13 and 29.03.2016 Provision for additional plantation on 1:7 basis to be implemented and guided by Tirhut model Systematic corridor level documentation for the trees cut and those saved shall be maintained by BSRDCL. 							
5. Shifting of Utilities								
5.1 Disruption of utility services to local community	<ul style="list-style-type: none"> Geometric adjustment has been made to minimize shifting need and/or the loss to any such facilities All community utilities and properties i.e., hand pumps, open wells, water supply lines, sewer lines, telephone cables, buildings and health centers shall not be relocated before construction of sub-project road starts. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any Relocation of wells, hand pumps at suitable locations with consent from 	Project requirement	Throughout the corridor	<p><u>MI</u>: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities</p> <p><u>PT</u>: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting</p>	Interaction with concerned utility authorities and local public	Included under BSRDCL's costs	Contractor/ BSRDCL/utility company	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	local community.							
5.2 Relocation of affected Cultural and Religious Properties	<ul style="list-style-type: none"> All religious property resources such as shrines, temples and mosques within the project road shall be relocated. If there is any relocation of the religious structures may happen then it shall be identified in accordance with the choice of the community. BSRDCL in consultation with local people shall finalize those. The entire process (i.e., selection of relocation sites and design) shall be under supervision of Environmental Specialist of CSC during the construction stage by the Contractor. The relocation shall be completed before the construction starts in these sites. 	MoRTH 110.7	Throughout the stretch especially nearby settlements	<p><u>MI</u>: Number of Religious structures within Col. Finalization of relocation site in consultation with local community.</p> <p><u>PT</u>: No. of complaints should be 0. Relocation of structures in consultation with local community at their preferred locations within shortest possible</p>	Consultation with local community	Included under BSRDCL's costs	BSRDCL/ Contractor	CSC/ BSRDCL
II. PRE-CONSTRUCTION ACTIVITIES BY THE CONTRACTOR/ ENVIRONMENTAL SPECIALIST OF CSC								
1. Field Verification and Modification of the Contract Documents								
1.1 Joint Field Verification	<ul style="list-style-type: none"> Environmental Specialist of CSC and the Contractor shall carry out joint field verification to ascertain any possibilities of saving trees, environmental and community resources, and these activities are to be taken up by the construction contractor. 	MoRTH 201.2	Throughout the stretch of project	<p><u>MI</u>: Joint verification of features at site</p> <p><u>PT</u>: Unnecessary tree felling to be avoided. Possibility of saving community features to be</p>	Physical verification of features	Included under BSRDCL's costs	Contractor/ Environmental Specialist of CSC	BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
1.2 Assessment of Impacts due to Changes/ Revisions/ additions in the Project Work	<ul style="list-style-type: none"> The Environmental Specialist of CSC shall assess impacts and revise/ modify the EMP and other required sections of the project document/s in the event of changes/revisions (including addition or deletion) in the project's scope of work. 		Where ever changes are applicable	<p>MI: Joint verification of features at site.</p> <p>PT: Updation in impact and mitigation measures due to proposed change</p>	Physical verification at changed location	Included under BSRDCL's costs	Contractor/ Environmental Specialist of CSC	BSRDCL
1.3 Crushers, Hot-mix plants and Batching Plants Location	<ul style="list-style-type: none"> All construction plants shall be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants shall be located at least 1.0 km away from the nearest dwelling preferably in the downwind direction. The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Specialist of CSC shall be necessary prior to the establishment. Arrangements to control dust pollution through provision of windscreens, water sprinklers, and dust extraction systems shall have to be provided at all such sites. Specifications for crushers, hot mix plants and batching plants shall comply with the requirements of the relevant emission control legislations. Consent for the Establishment and Operation from BSPCB shall be obtained before establishment and operation respectively and a copy should be submitted to the CSC and BSRDCL. Wherever there are extremely water 	MoRTH, 111.1, Air (prevention of pollution) Act, 1981 and Noise Rules	At all Crushers, Hot-mix plants and Batching Plants opened up for the construction of project road	<p>MI: Siting criteria as per statutory provisions of Pollution Control Board. The agreement with the land owner for the land where the establishment of plant proposed by the contractor.</p> <p>PT: The siting of plants as per norms. Status of obtaining NOC (CtE & CtO) from state Pollution Control Boards</p>	Checking of copy of valid NOC obtained from State Pollution Control Board and copy of agreement with land owner whose land will be utilized for establishment of plants	Incidental	Contractor/ Environmental Specialist of CSC	BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	scarcity areas exist the Water sprinkling shall be limited to one time in the morning. To balance this deficient information boards shall be erected at appropriate locations with a message to "Dust prone area take precautions".							
1.4 Other Construction Vehicles, Equipment and Machinery	<ul style="list-style-type: none"> All vehicles, equipment and machinery to be procured for construction shall confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 and Motor Vehicles Act, 1988 shall be strictly adhered to. The silent/quiet equipment available in the market shall be used in the Project. The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced to EC, BSRDCL's verification whenever required. 	Air pollution Control Act, and Noise Rules and Motor Vehicle Act, 1988	Applicable to all vehicles used in the construction	<p><u>MI</u>: verification of valid PUC</p> <p><u>PT</u>: verification of valid PUC. Zero deviation/ complaints about pollution</p>	Verification of PUC certificate	Part of Civil Cost	Contractor/ Environmental Specialist of CSC	BSRDCL
1.5 Construction Camp Locations - Selection, Design and Layout	<ul style="list-style-type: none"> Siting of the construction camps shall be as per the guidelines and details of layout to be approved by CSC Resident Engineer and environment specialist. Camps to maintain minimum distance from following: <ul style="list-style-type: none"> # 500 m from nearest settlements to avoid conflicts # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route Construction camps shall not be proposed and stress over the infrastructure facilities with the local community. 	As per IRC guidelines and contract documents.	Construction camps	<p><u>MI</u>: The agreement with the land owner for the land where the camp site is proposed by the contractor</p> <p><u>PT</u>: The siting of camp as per norms. Status of agreement with the land owner. Zero complains and accidents at camp site. Provision of</p>	Checking of copy of agreement with land owner whose land will be utilized for establishment of camp. Review of basic facilities and their conditions. Complaints of the residents	Part of Civil Cost	Contractor/ Environmental Specialist of CSC	BSRDCL/ CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<ul style="list-style-type: none"> Location for stockyards for construction materials shall be identified at least 300m away from watercourses. Contractor's camps shall be identified at least 1.5 km away from the Reserved/ Protected Forest. 			basic facilities and tier maintenance	staying in the camp			
2. Identification and Selection of Material Sources								
2.1 Borrow area Identification and Approvals	<ul style="list-style-type: none"> Finalizing soil borrowing earth and all logistic arrangements as well as compliance to environmental requirements as applicable, shall be the sole responsibility of the Contractor. Contractor shall not start borrowing earth from selected borrow area until the formal agreement is signed between landowner and Contractor and a copy is submitted to the CSC. Locations finalized by the Contractor shall be reported to the Environmental Specialist of CSC and he shall submit the report to BSRDCL. Planning of haul roads for accessing borrows areas shall be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible and shall use the existing village roads wherever available. The environmental specialist of the CSC shall be required to inspect every borrow area location prior to its approval. CSC to include the Request for Inspection form for borrow area assessment and approval from the environmental perspective. Non-productive, barren lands, to be used for borrowing earth with the necessary permissions/ consents. 	IRC Guidelines on borrow areas and quarries. EPA 1986 and MoRTH 111.2 and 305.2.2 Specifications for Road and Bridgeworks Guidelines for Borrow Areas management	Contractor is responsible for identifying the borrow area with all leads and lifts conforming Technical Specification after securing all permits as per Law of the Land.	<p>MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.</p> <p>PT: No case of non-compliance to the technical specification and air act. Zero accidents. Zero complaints.</p>	Review of design documents and site observations Inspection of site for approval on environmental consideration	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
2.2 Quarry operations	<ul style="list-style-type: none"> Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. Contractor shall also work out haul road network and report to Environmental Specialist of CSC and CSC shall inspect and report to BSRDCL before approval. Copies of consent/ approval/ rehabilitation plan for a new quarry or use of existing source will be submitted to BSRDCL. The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA. Contractor will obtain environmental clearance (EC) from SEIAA/ DEIAA for identified quarry if intended to open new quarry site. Comply to EC conditions of SEIAA/ DEIAA. The Contractor will obtain lease license from Department of Geology and Mines 	ClauseNo.111.3MORT&H Specifications for Road and Bridgeworks Guidelines VI for Quarry Areas Management Environmental Protection Rules	Identified Quarry location. Contractor is responsible for identifying the source conforming Technical Specification after securing all permits as per Law of the Land.	<p>MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.: No case of non-compliance to consent conditions and air quality meets the prescribed limit</p>	Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries	Included in civil works cost	Contractor	BSRDCL /CSC
2.3 Sand	<ul style="list-style-type: none"> The Sand shall be procured from identified sand mines as far as possible. The Contractor shall obtain copy of the Lease Agreement of the supplier and submit to CSC before procuring the sand. 	As per the contract document	Sand quarries being used for the construction. All riverbeds recommended for sand extraction for the project.	<p>MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.:</p>	Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening	Included in civil works cost	Contractor	Environmental Specialist of CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
				No case of non-compliance to consent conditions and air quality meets the prescribed limit	new quarries			
B. CONSTRUCTION STAGE								
1. Air Quality								
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	<ul style="list-style-type: none"> Contractor shall take every precaution to reduce the level of dust from construction plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source. Contractor to submit location and layout plan for storage areas of construction materials approved by CSC. Contractor shall erect the construction plants and machinery, which shall conform to the pollution control norms specified by MoEF&CC/ CPCB Transport, loading and unloading of loose and fine materials through covered vehicles. Paved approach roads. Storage areas to be located downwind of the habitation area. Water spraying on earthworks, unpaved haulage roads and other dust prone areas. Provision of PPEs to workers. 	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document	Throughout project corridor	<p><u>MI</u>: PM10 level measurements Complaints from locals due to dust</p> <p><u>PT</u>: PM10 level < 100 g/m³ Number of complaints should be 0.</p>	Standards CPCB methods Observations Public consultation Review of monitoring data maintained by contractor	Included in civil works cost/ Incidental to work	Contractor	BSRDCL /CSC
1.2 Emission of air pollutants (HC, SO ₂ , NO _x , CO etc.) from vehicles due to traffic	<ul style="list-style-type: none"> Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant statutory requirements of CPCB and/ Motor Vehicles Rules 	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG set's locations	<p><u>MI</u>: Levels of HC, SO₂, NO₂, and CO. Status of PUC certificates</p> <p><u>PT</u>: SO₂ and</p>	Standards CPCB methods Review of monitoring data	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
congestion and use of equipment and machinery	<p>Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement.</p> <ul style="list-style-type: none"> Only crushers licensed by the SPCB shall be used. DG sets with stacks of adequate height and use of low Sulphur diesel as fuel. Contractor shall submit PUC certificates for all vehicles/ equipment/ machinery used for the project. LPG should be used as fuel source in construction camps instead of wood Ambient air quality monitoring is to be conducted as per the monitoring plan Contractor to prepare traffic management and dust suppression plan duly approved by BSRDCL 	Annexure 'A' to MoRTH 501 MoRTH:111.10 Contract Agreement		NO ₂ levels are both less than 80ug/m ³ . PUC certificate of equipment and machinery is up to date	maintained by contractor			
2. Noise								
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	<ul style="list-style-type: none"> All Construction plants and equipment used in construction shall strictly conform to the MoEF&CC/ CPCB noise standards. Construction equipment and machinery to be fitted with silencers and maintained properly. All equipment to be timely serviced and properly maintained. The equipment available in the market should be procured, if the Contractor plans to purchase new equipment. For the old equipment, necessary or possible alterations must be carried out to reduce the noise levels to the possible extent. At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, operation of DG sets, use of high noise 	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	<p>Throughout project section especially at construction sites, residential and identified sensitive locations.</p> <p>Refer supplementary tables to EMP for information on sensitive receptors.</p> <p>Noise barriers at Schools at km 17+400 (LHS), km 22+100 (LHS), km 24+000 (LHS), km 24+100 (LHS), km 26+200 (LHS), km 27+600 (LHS) and km 26+700 (RHS).</p>	<p><u>MI</u>: day and night Noise levels. Number of complaints from local people</p> <p><u>PT</u>: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas</p>	As per Noise rule, 2000 Consultation with local people Review of noise level monitoring data maintained by contractor Observation of construction site	Included in civil works costs	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementa tion	Supervisi on
	<p>generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am. Working hours of the construction activities shall be restricted around educational institutions/ Health Centers (silent zones) up to a distance of 100 m from the sensitive receptors i.e., School, Health Centers and Hospitals etc. during off hours only.</p> <ul style="list-style-type: none"> • Implement noisy operations intermittently to reduce the overall noise exposure. • Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards. • Restrict construction near residential, built up and forest areas construction to daylight hours. • Honking restrictions near sensitive areas PPEs to workers. • Noise monitoring shall be carried out at the locations specified in monitoring plan by the BSRDCL and the Engineer through the approved monitoring agency. 							
3. Land and Soil								
3.1 Land use Change and Loss of productive/ topsoil	<ul style="list-style-type: none"> • Non-agricultural areas to be used as borrow areas to the extent possible. • In case agricultural and is used, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. • Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use. • To prevent any compaction of soil in the adjoining productive agricultural lands, 	Project requirement	<p>Throughout the project section and borrow areas</p> <p>Land identified for camp, storage areas etc.</p>	<p>MI: Borrow pit locations/Top soil storage area</p> <p>PT: Zero complaints or disputes registered against contractor by land owner</p>	Review borrow area plan, site visits	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	the movement of construction vehicles, machinery and equipment's will be restricted to project corridor as much as possible.							
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	<ul style="list-style-type: none"> After construction of road embankment, the side slopes shall be covered with grass and shrubs as per design specifications. Slope protection by providing Grass turfing, stone pitching, masonry retaining walls, at high embankments Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. The earth stock piles to be provided with gentle slopes to soil erosion. In borrow pits, the depth shall be so regulated that the sides of the excavation shall have a slope no steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. Along sections abutting water bodies, pitching as per design specification shall protect slopes. 	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 303 and 305 2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	At bridge approaches; high embankment sections (Low lying areas) and borrow pits.	<p>MI: Occurrence of slope failure or erosion issues</p> <p>PT: No slope failures. Minimal erosion issues</p>	Review of design documents and site observation	Included in civil works cost/	Design consultant and Contractor,	BSRDCL /CSC
3.3 Borrow area management	<ul style="list-style-type: none"> No borrow area shall be opened without permission of the Environmental Specialist of CSC. The location, shape and size of the designated borrow areas shall be as approved by the Environmental Specialist of CSC and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC: 10: 1961). Non-productive, barren lands, to be 	IRC Guidelines on borrow areas and for quarries (Environment alprotectionAct and Rules, 1986; Water Act, Air Act)	Contractor is responsible for identifying the borrow area with all leads and lifts conforming Technical Specification after securing all permits as per Law of the Land.	<p>MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of</p>	<p>Review of design documents and site observations</p> <p>Compare site conditions</p>	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>used for borrowing earth with the necessary permissions/consents.</p> <ul style="list-style-type: none"> The borrowing operations shall be carried out as specified in the guidelines for siting and operation of borrow areas. The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; shall be maintained dust free by the Contractor. Sprinkling of water shall be carried out twice a day to control dust along such roads during their period of use. During dry seasons (winter and summer) frequency of water sprinkling shall be increased in the settlement areas and Environmental Specialist of CSC shall decide the sprinkling time depending on the local requirements. Depths of borrow pits to be regulated and sides not steeper than 25%. Topsoil to be stockpiled and protected for use at the rehabilitation stage. Transportation of earth materials through covered vehicles. Borrow areas not to be dug continuously. Contractor shall rehabilitate the borrow areas as soon as borrowing of soil is over from a particular borrow area in accordance with the approved Borrow Area Redevelopment Plan. 	+Clause305.2 .2MORTH Specifications for Road and Bridgeworks Guidelines for Borrow Areas management		<p>accidents. Complaints from local people.</p> <p><u>PT</u>: No case of non-compliance to statutory norms and technical specification Zero accidents. Zero complaints.</p>	with Land owner's agreement and statutory/ environmental approvals			
3.4 Quarry Operations	<ul style="list-style-type: none"> Aggregates will be sourced from existing licensed quarries. The Contractor shall obtain materials from quarries only after consent of the Department of Mines & Geology and 	ClauseNo.111 .3 MoRT&H Specifications for Road and Bridgeworks	Contractor is responsible for identifying the source conforming Technical Specification after securing all permits as per Law of the Land.	MI: Existence of licenses quarry areas from which materials to be sourced	Review of design documents, contractor documents	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>District Administration.</p> <ul style="list-style-type: none"> Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing source will be submitted to BSRDCL. Contractor will extract the materials as per approved mining plan. Contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA. The Contractor will comply with the conditions stipulated in the Environmental clearances and mining lease. In case blasting is required for extraction of stone from quarry the contractor will follow the following guidelines: Except as may be provided in the contract or ordered or authorized by the Engineer, the Contractor shall not use explosives. Where the use of explosives is so provided or ordered or authorized, the Contractor shall comply with the requirements of the following Sub-Clauses of MoRTH 302 besides the law of the land as applicable. Contractor shall at all times take every possible precaution and shall comply with appropriate laws and regulations relating to the importation, handling, transportation, storage and use of explosives. The contractor shall at all times when engaged in blasting operations, post sufficient warning flagmen, to the full satisfaction of the 	<p>Guidelines VI for Quarry Areas Management Environmental Protection Rules</p>		<p>and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.: No case of non-compliance to consent conditions and air quality meets the prescribed limit</p>	<p>and site observation Compliance to EC conditions in case of opening new quarries</p>			

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementa tion	Supervisi on
	<p>Engineer.</p> <ul style="list-style-type: none"> Contractor shall at all times make full liaison with and inform well in advance and obtain such permission as is required from all Government Authorities, public bodies and private parties whomsoever concerned or affected or likely to be concerned or affected by blasting operations. Blasting shall be carried out only with permission of the Engineer. All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, storage, handling and use of explosives shall be strictly followed. Blasting shall be carried out during fixed hours (preferably during mid day) or as permitted by the Engineer. The timing should be made known to all the people within 1000 m (200 m for pre-splitting) from the blasting site in all directions. 							
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	<ul style="list-style-type: none"> Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction. Approach roads haulage roads shall be designed along the barren and hard soil area to reduce the compaction. Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads. Land taken for construction camp and other temporary facility shall be restored to its original conditions. 	Design requirement	Parking areas, Haulage roads and construction yards.	<p>MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not been restored to its original condition</p> <p>PT: Zero occurrence of destroyed/compacted land and</p>	Site observation	Included in civil works cost	Contractor	BSRDCL /CSC

Section-6: EMP

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
				undestroyed land				
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non-bituminous debris generated from demolition and road construction	<ul style="list-style-type: none"> Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil. Fuel storage and refueling sites to be kept away from drainage channels. Unusable debris shall be dumped in ditches and low-lying areas. To avoid soil contamination Oil-Interceptors shall be provided at wash down and refueling areas. Waste oil and oil-soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF&CC/ SPCB authorized vendors Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. Bituminous wastes will be disposed off in an identified dumping site approved by the SPCB. 	Design requirement	Fueling station, construction sites, and construction camps and disposal location.	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area PT: Soil test conforming to no – contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Included in civil work cost.	Contractor	BSRDCL /CSC
4. Water Resources								
4.1 Sourcing of water during Construction	<ul style="list-style-type: none"> Water availability and supply to nearby communities unaffected. Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority in view of National Green Tribunal. Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. Water intensive activities not to be undertaken during summer season. Groundwater Augmentation by 	CGWA Guidelines	Throughout the Project section and enhancement of existing roadside water harvesting structures being used by local peoples. Pond at km 17.800 (LHS) and km 26.900 (RHS) shall be enhanced as ghat for domestic usage during construction stage.	MI: Approval from competent authority. Complaints from local people on water availability PT: Valid approval from competent authority. Zero complaints from	Checking of documentation Talk to local people	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<ul style="list-style-type: none"> converting borrow areas into ponds Enhancement of community ponds. 			local people.				
4.2 Disposal of water during construction	<ul style="list-style-type: none"> Provisions shall be made to connect road side drains with existing nearby natural drains. 	Clause No.1010 EP Act 1986 MoRTH Specifications for Road and Bridgeworks	Throughout the Project section	<p><u>MI</u>: Condition of drainage system in construction site. Presence/absence of water logging in project area.</p> <p><u>PT</u>: Existence of proper drainage system. No water logging in project area</p>	Standards methods Site observation and review of documents	Included in civil works cost	Contractor	BSRDCL /CSC
4.3 Alteration in surface water hydrology	<ul style="list-style-type: none"> Existing drainage system to be maintained and further enhanced. Provision shall be made for adequate size and number of cross drainage structures especially in the areas where land is sloping towards road alignment. Road level shall be raised above HFL level wherever road level is lesser than HFL. Culverts reconstruction shall be done during lean flow period. In some cases, these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction. Temporary water diversions after approval of CSC shall be provided on requirement at bridge and culverts construction locations to maintain the natural flow unobstructed. 	Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridge	Rivers, canal, streams and nallah passing through the proposed road.	<p><u>MI</u>: Proper flow of water in existing streams and rivers</p> <p><u>PT</u>: No complain of water shortage by downstream communities. No record of overtopping/ water logging</p>	Review of design documents Site observation	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
4.4 Siltation in water bodies due to construction activities/earthwork	<ul style="list-style-type: none"> • Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. • Provision of Silt fencing shall be made at water bodies. • Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. • Earthworks and stone work to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. • Retaining walls at water bodies /ponds to avoid siltation near ponds. 	<p>Design requirement, Clause No 501.8.6. MORT&H Specifications for Road and Bridgeworks</p> <p>Worldwide best practices.</p>	<p>Rivers, canal, streams and nallah passing through the proposed road.</p> <p>Doma Pond at km 17+800 (LHS), Dry River at km 19+700 (LHS), Kaima Pond at km 24+600 (LHS), Pond at km 25+900 (LHS), Kopadiya River (Koshi) at km 18+500 (RHS), Canal at km 19+100 (RHS), Pond at km 23+600 (RHS), Pond at km 25+400 (RHS), Khantar Das pond at km 26+900 (RHS), Pond at km 27+300 (RHS) and Karbala Pond at km 27+400 (RHS).</p>	<p><u>MI</u>: Presence /absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels</p> <p><u>PT</u>: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit</p>	Field observation	Included in civil works cost	Contractor	BSRDCL /CSC
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment's and waste from construction camps.	<ul style="list-style-type: none"> • Parking and refueling away from water bodies/waterways • Oil/ grease trap and fueling platforms to be provided at refueling locations. • Chemicals and oil shall be stored away from water on concrete platform with catchment pit for spills collection. • All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand, written in the local language emergency response procedure, including reporting, will be provided by the contractors. • Construction camp to be sited away from water bodies. • Wastes must be collected, stored and 	<p>The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.</p>	<p>Doma Pond at km 17+800 (LHS), Dry River at km 19+700 (LHS), Kaima Pond at km 24+600 (LHS), Pond at km 25+900 (LHS), Kopadiya River (Koshi) at km 18+500 (RHS), Canal at km 19+100 (RHS), Pond at km 23+600 (RHS), Pond at km 25+400 (RHS), Khantar Das pond at km 26+900 (RHS), Pond at km 27+300 (RHS) and Karbala Pond at km 27+400 (RHS).</p>	<p><u>MI</u>: Water quality of ponds, streams, rivers and other water bodies in project</p> <p>Presence of oil floating in water bodies in project area</p> <p><u>PT</u>: Surface water quality meets freshwater quality standards prescribed by</p>	<p>Conduction of water quality tests as per the monitoring plan</p> <p>Field observation</p>	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	taken to approve disposal site only. • Water quality shall be monitored			CPCB				
5. Flora and Fauna								
5.1 Road side Plantation Strategy	<ul style="list-style-type: none"> The Contractor shall do turfing on embankment slopes, plantation of shrubs as specified in the Contract. The compensatory plantation shall be carried out by the State Forest Department. Minimum 80 percent survival rate of the saplings shall be acceptable otherwise the Contractor/ Forest Department shall replace dead plants at his own cost. The Environmental Specialist of CSC shall inspect regularly the survival rate of the trees planted by the Contractor in accordance with the plantation strategy suggested. 	As per the contract document and MoRTH 301.3.3	Throughout the length of project corridor	<p>MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.</p> <p>PT: Survival of Compensatory Plantation @ 80% and Additional plantation @ 80% done on Tirhut model</p>	Review of relevant documents – tree cutting permit, compensatory plantation plan and key informants on Tirhut model of plantation Field observations	Additional plantation and compensatory plantation cost is included in project costs under BSRDCL.	Contractor	Environmental Specialist of CSC, BSRDCL
5.2 Damage to Flora and chance found Fauna	<ul style="list-style-type: none"> The Contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/ vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any animal is found near the construction site at any point of time, the contractor shall immediately upon discovery thereof acquaint in the Environmental Specialist of CSC and carry out his instructions for dealing with the same. Environmental Specialist of CSC shall report to the nearby forest office (Range office or Divisional office) and shall take appropriate steps/ measures, 	Wildlife Protection, Act and EMP and Bid	Throughout project corridor especially near forest stretches including surface water bodies	<p>MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.</p> <p>PT: Survival of Compensatory Plantation @ 80% and Additional plantation @ 80% done on Tirhut model</p>	Visual observation and record checking	Included in civil works cost	Contractor	Environmental Specialist of CSC, BSRDCL

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							Implementation	Supervision
	if required in consultation with the forest officials.							
6. Construction Camps/sites Management and Occupational Health and Safety								
6.1 Impact associated with location	<ul style="list-style-type: none"> Contractor shall follow all relevant provisions of the Building and the other Construction Workers (Regulations of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The location, layout and basic facility provision of each labour camp shall be submitted to CSC and BSRDCL prior to their construction. The Construction shall commence only upon the written approval of the Environmental Specialist of CSC. The Contractor shall maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the CSC. 	The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is less than 500m from listed locations	On site observation Interaction with workers and local community	Included in civil works cost	Contractor and EO	BSRDCL /CSC
6.2 Potable Water	<ul style="list-style-type: none"> The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The Contractor shall also provide potable water facilities within the premises of every camp at an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. The Contractor shall also guarantee the following: <ul style="list-style-type: none"> Supply of sufficient quantity of Potable Water (as per IS) in every workplace/labour camp (Site at suitable and easily accessible places and 	The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996	Construction site, Labour camp	MI: Provision of potable water PT: Storage of water having sufficient capacity. Complaints of bad water quality by workers	Visual observation of maintenance of the facilities. Water quality test report	Included in civil works cost	Contractor	Environmental Specialist of CSC, BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>regular maintenance of such facilities.</p> <ul style="list-style-type: none"> If any water storage tank is provided that shall be kept such that the bottom of the tank at least 1 m above the surrounding ground level. If water is drawn from any existing well, which is within 30 m proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking. All such wells shall be entirely covered and provided with a trap door, which shall be dust proof and water proof. A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once in a month. Analysis of water shall be done every month as per parameters prescribed in IS 10500-1991. Environmental Specialist of CSC shall be required to inspect the labour camp once in a week to ensure the compliance of the EMP. 							
6.3 Sanitation and Sewage System	<p>The Contractor shall ensure that –</p> <ul style="list-style-type: none"> The Sewage system for the camp is designed, built and operated in such a manner that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place Separate toilets/ bathrooms, wherever required, screened from those form men (marked in vernacular) are to be provided for women Adequate water supply is to be provided in all toilets and urinals Night soil can be disposed of with the 	<p>The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 MoRTH:114.14</p>	Labour camps	<p>MI: Provision toilets and bathroom units and septic tank with soak pits and drainage networks PT: No discharge outside the camp area. Zero complaints from surrounding</p>	Visual observation of site.	Included in civil works cost	Contractor	Environmental Specialist of CSC, BSRDCL

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							Implementation	Supervision
	help of local municipal extractor or disposed of by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm layer of waste or refuse and then covered with a layer of earth for fortnight.			population. Zero water borne diseases in camp site				
6.4 Waste Disposal	<ul style="list-style-type: none"> The Contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Specialist of CSC. 	Annexure 'A' to MoRTH Clause 501 and The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996	Camp site	MI: Number and capacity of Dust bins PT: No disposal outside the camp area. Zero complaints from surrounding population.	Visual observation at site.	Included in civil works cost	Contractor	Environmental Specialist of CSC, BSRDCL
6.5 Worker's Health in construction camp/construction sites	<ul style="list-style-type: none"> The Contractor will provide preventive medical facilities in camp Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste. The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations. No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community. Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases. All necessary fencing and lights will be 	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	All construction camps	MI: Camp health records Existence of proper first aid kit in camp site Complaints from workers. PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site	Camp records Site observation Consultation with contractor workers and local people living nearby	Part of the civil works costs	Contractor	BSRDCL /CSC

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							Implementa tion	Supervisi on
	<p>provided to protect the public in construction zones.</p> <ul style="list-style-type: none"> All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the „Engineer“. Readily available First Aid Kits will all the essential first aid items will be maintained at camp site, construction site, plant site and other site of activities 			conditions.				
7. Management of Construction Waste/Debris								
7.1 Selection of Dumping Sites	<ul style="list-style-type: none"> Contractor to submit a waste/soil disposal plan and get it approved by CSC and EA. Create controlled dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality Unproductive/ wastelands shall be selected for dumping sites away from residential areas and water bodies Dumping sites must be having adequate capacity equal to the amount of debris generated. Public perception and consent from the village Panchayats has to be obtained before finalizing the location. 	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	At all Dumping/ Disposal Sites	<p><u>MI</u>: Location of dumping sites Number of public complaints.</p> <p><u>PT</u>: No public complaints. Consent letters for all dumping sites available with contractor</p>	Field survey and interaction with local people. Review of consent letter	Included in civil works cost.	Contractor.	BSRDCL /CSC
7.2 Reuse and disposal of construction and dismantled	<ul style="list-style-type: none"> The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps temporary traffic diversions, and haulage routes. 	Design Requirement, MORT&H guidelines and General Conditions of	Throughout the project corridor	<p>MI: Percentage of reuse of existing surface material</p> <p>Method and</p>	Contractor records Field observation	Included in civil works cost.	Contractor.	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
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waste	<ul style="list-style-type: none"> All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed. Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed on-site. The disposable debris may be utilized for following purposes: <ul style="list-style-type: none"> For filling and leveling of School grounds and proposed parking areas. The sub-grade of the existing pavement shall be used as embankment fill material. Existing base and sub-base material shall be recycled as sub-base of the haul road or access roads. The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. The Contractor shall suitably dispose off unutilized debris materials either through filling up of borrows areas 	Contract Document		<p>location of disposal site of construction debris</p> <p>PT: No public complaint and consent letters for all dumping sites available with contractor or CSC</p>	Interaction with local people			

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							Implementation	Supervision
	<p>located in wasteland or at pre-designated disposal locations, subject to the approval of the Environmental Expert of CSC.</p> <ul style="list-style-type: none"> • At locations identified for disposal of bituminous wastes, the disposal shall be carried out over a 30 mm thick layer of rammed clay so as to eliminate the possibility of scarified percolation of leachate into the ground water. The Contractor shall ensure that the surface area of such disposal pits is covered with a layer of soil and subsequent turfing. • All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, shall be considered incidental to the work and shall be planned and implemented by the Contractor as approved and directed by the Environmental Expert of CSC. • The pre-designated disposal locations shall be a part of Waste Disposal Plan in consultation and with approval of Environmental Expert of CSC. • Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or for mud puddles in the area. • All waste materials shall be completely disposed and the site shall be completely cleaned and certified by Environmental Specialist of CSC before handing over. • The Contractor at his cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise 							

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							Implementation	Supervision
	on account of lack of action on his part.							
8. Traffic Management and Safety								
8.1 Management of existing traffic and safety	<ul style="list-style-type: none"> Traffic Management Plan shall be submitted by the contractor and approved by the CSC. The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road. The Contractor shall take all necessary measures for the safety of traffic during construction and provide erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the Environmental Expert of CSC for the information and protection on traffic approaching or passing through the section of any existing cross roads. The Contractor shall ensure that all signs, barricades, pavement markings are provided as per the MoRTH specifications. The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved 	Design requirement and IRC: SP: 27 - MoRTH: 112.4 MoRTH: 112.1 IRC: SP:55-2014 Bid Document	Throughout the project corridor especially at intersections and settlements.	<p><u>MI</u>: Traffic management plan. Presence/ absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users.</p> <p><u>PT</u>: No accidents. No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site</p>	<p>Review traffic management plan</p> <p>Field observation of traffic management and safety system</p> <p>Interaction with people in vehicles using the road</p>	Included in civil works cost.	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>diversions will be constructed.</p> <ul style="list-style-type: none"> Restriction of construction activity to only one side of the existing road The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures. 							
8.2 Pedestrian, animal movement	<ul style="list-style-type: none"> Temporary access and diversion, with proper drainage facilities. Access to the schools, temples and other public places must be maintained when construction takes place near them. Fencing wherever cattle movement is expected. Large number of box and slab culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals 	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	<p>MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people</p> <p>PT: Easy access to schools, temples and public places. Zero complaints</p>	Field observation Interaction with local people	Included in civil works cost.	Contractor	BSRDCL /CSC
8.3 Safety of Workers and accident risk from construction activities	<ul style="list-style-type: none"> Contractors to adopt and maintain safe working practices. Contractor shall provide: Protective footwear, protective goggles and nose masks to the workers employed in asphalt works, concrete works, crusher etc. Welder's protective eye-shields to workers who are engaged in welding works Earplugs to workers exposed to loud noise, and workers working in crushing 	Same as above	Construction sites	<p>MI: Availability of Safety gears to workers</p> <p>Safety signage Training records on safety</p> <p>Number of safety related accidents</p>	<p>Site observation</p> <p>Review records on safety training and accidents</p> <p>Interact with construction workers</p>	Included in civil works cost	Obligation of Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>or compaction</p> <ul style="list-style-type: none"> The Contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract. The Contractor shall make sure that during the construction work all relevant provisions of Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor shall not employ any person below the age of 18 years for any work and no woman shall be employed on the work of painting with products containing lead in any form The Contractor shall also ensure that paint containing lead or lead products is used except in the form of paste or readymade paint. Usage of fluorescent and retro refractory signage in local language at the construction sites Training to workers on safety procedures and precautions. Appointment of a safety officer. All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied 			PT: Zero fatal accidents. Zero or minor non-fatal accidents.				

Section-6: EMP

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<ul style="list-style-type: none"> with. Provision of readily available first aid unit including an adequate supply of dressing materials. Use of hazardous material should be minimized and/or restricted. Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies. Accident Prevention Officer must be appointed by the contractor. 							
8.4 Risk from electrical equipment's	<ul style="list-style-type: none"> The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that: No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights shall be provided to protect the public in construction zones. All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of CSC. 	Contract Agreement and Annexure 'A' to MoRTH Clause 501, The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act, 1996 and Factories Act, 1948	Throughout construction zones, plant sites and camp site and storage areas, DG sets	MI: Electric connections/ wiring system Number of safety related accidents PT: Zero accidents.	Visual observation of electric connections	Included in civil works cost	Contractor	Environmental Specialist of CSC, BSRDCL
8.5 Accident risk to local community	<ul style="list-style-type: none"> Restrict access to construction sites only to authorized personnel. Physical separation must be provided for movement of vehicular and human traffic. All measures for the safety of traffic during construction viz. signs, markings, flags, lights and flagmen as 	Same as above	Construction sites and Accident-Prone Area	MI: Safety signs and their location Incidents of accidents Complaints from local	Site inspection Consultation with local people	Included in civil works cost	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>proposed in the Traffic Control Plan/Drawings shall be taken.</p> <ul style="list-style-type: none"> Provision of temporary diversions and awareness to locals before opening new construction fronts. Alternate access facility to common properties near construction zones Fencing and speed limitation wherever cattle movement is anticipated. 			<p>people PT: Zero incident of accidents. Zero complaints.</p>				
8.6 Risk force measure	<ul style="list-style-type: none"> Contractor shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. Contractor shall make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor shall identify necessary actions in the event of an emergency. 	Contract Agreement and Annexure 'A' to MoRTH Clause 501	At all activities areas Throughout the construction phase	<p>MI: Development of Emergency Response system and emergency preparedness</p> <p>Complaints from local people PT: Zero incidents</p>	Documents on Emergency Response System/ Record of Mock Drilling record of regular checking's	Included in civil works cost	Contractor	CSC/ BSRDCL
9. Site Restoration and Rehabilitation								
9.1 Clean-up Operations, Restoration and Rehabilitation	<ul style="list-style-type: none"> Contractor shall prepare site restoration plans, which shall be approved by the Environmental Specialist of CSC. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization. The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Comprehensive Waste Management Plan and as approved by CSC. All disposal pits or trenches shall be filled in and effectively sealed off. Residual topsoil, if any shall be 	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	<p>MI: camp, Condition borrows areas and construction sites, Presence/absence of construction debris after construction works is over</p> <p>PT: Clean and tidy sites. No</p>	<p>Site observation</p> <p>Interaction with locals</p> <p>Issue completion certificate after restoration of all sites is found satisfactory</p>	Included in civil works cost.	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>distributed on adjoining/proximate barren land or areas identified by the Contractor and approved by the Environmental Specialist of CSC in a layer of thickness of 75 mm – 150 mm.</p> <ul style="list-style-type: none"> All construction zones and facilities including culverts, road side areas, camps, Hot Mix plant sites, Crushers, batching plant sites and any other area used/affected due to the project operations shall be left clean and tidy at the Contractor's expense, to the entire satisfaction to the Environmental Specialist of CSC. 			trash or debris left on site. Site restored/leveled.				
10. Impact on Cultural and Archaeological Features								
10.1 Chance Found Archaeological Property	<ul style="list-style-type: none"> All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He shall, immediately upon discovery thereof and before removal acquaint the Environmental Specialist of CSC of such discovery and carry out the CSC's instructions for dealing with the same, waiting which all work shall be stopped. The CSC shall seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site. The Archaeological structures identified along the road sides should be 	The Ancient Monuments and Archaeological Sites and Remains Act, 1958	Throughout project corridor	<p><u>MI</u>: Identification of Archaeological features during excavation activities</p> <p><u>PT</u>: Intimation to CSC and Respective Department.</p>	Photographic records and visual observation at site	Included in civil works cost.	Contractor	BSRDCL /CSC

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	protected/ preserved or enhanced as per the law.							
C. OPERATION AND MAINTENANCE STAGE								
1. Performance Monitoring of Proposed Development								
1.1 Monitoring Operation Performance	<ul style="list-style-type: none"> The BSRDCL shall monitor the operational performance of the various mitigation/enhancement measures carried out as a part of the project. The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision made under the project; status of rehabilitation of borrow areas and effectiveness of noise barriers. 	As per the contract document	Throughout the project corridor				BSRDCL	BSRDCL
2. Pollution Monitoring								
2.1 Pollution Monitoring	<ul style="list-style-type: none"> The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil quality in the selected locations as suggested in pollution monitoring plan through the BSPCB or its approved monitoring agency. 	Environmental Protection Act, 1986 and The noise pollution (regulation and control) rules, 2000	At representative locations as per the instructions of Env. Engineer	<p><u>MI</u>: Test results of environmental attributes of air, water, noise and soil</p> <p><u>PT</u>: No parameters exceed the standard limits and levels are equal or below the baseline data</p>	Environmental monitoring and test reports	As per Environmental Monitoring Cost Included in Operation/Maintenance cost	Pollution Monitoring Agency	BSRDCL
1. 3. Air Quality								
3.1 Air pollution due to vehicular movement	<ul style="list-style-type: none"> Compensatory tree plantations shall be maintained as prescribed by forest department. 80% survival rate for additional plantation shall be maintained as per Tirhut model Regular maintenance of the road will be 	Environmental Protection Act, 1986; The Air (Prevention and Control of	Throughout the Corridor	<p><u>MI</u>: Ambient air quality (PM₁₀, CO, SO₂, NO₂)</p> <p><u>PT</u>: Levels are</p>	As per CPCB requirements	Included in Operation/Maintenance cost	BSRDCL	

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementa tion	Supervisi on
	<p>done to ensure good surface condition</p> <ul style="list-style-type: none"> Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken. Signages shall be provided reminding the drivers/road users to properly maintain their vehicles to economize on fuel consumption. Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment's 	Pollution) Act, 1981		equal to or below baseline levels (Air Quality Standard, CPCB)	Site inspection			
2. 4. Noise Pollution								
4.1 Noise due to movement of traffic	<ul style="list-style-type: none"> Effective traffic management and good riding conditions shall be maintained Speed limitation and honking restrictions near sensitive receptors. Construction of noise barriers near sensitive receptors with consent of local community The effectiveness of the multilayered plantation should be monitored and if needed, solid noise barrier shall be placed. Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road. 	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof	<p>Sensitive receptors as given in supplementary table to EMP.</p> <p>Noise barriers at Schools at km 17+400 (LHS), km 22+100 (LHS), km 24+000 (LHS), km 24+100 (LHS), km 26+200 (LHS), km 27+600 (LHS) and km 26+700 (RHS).</p>	<p>MI: Noise levels</p> <p>PT: Levels are equal to or below baseline levels (Noise Quality Standard, CPCB)</p>	Noise monitoring as per noise rules ,2000 Discussion with people at sensitive receptor sites	Included in Operation/Maintenance cost	BSRDCL	
5.Land and Soil								
5.1 Soil Erosion and Monitoring of Borrow Areas	<ul style="list-style-type: none"> Visual Monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried out once in every three months 	MoRTH 305.2.2.2 and 306. Project requirement	Borrow areas and embankment slopes	<p>MI: observed Erosion</p> <p>PT: No erosion. suitable erosion control</p>	Visual observation especially after monsoon MI:	As per Environmental Monitoring Cost Included in	BSRDCL	BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	<p>as suggested in monitoring plan. to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc.</p> <ul style="list-style-type: none"> Necessary measures to be followed wherever there are failures Necessary measures to be followed wherever there are failures 			measures to be provided immediately once it is noticed	Existence of soil erosion sites Number of soil erosion sites PT: Zero or minimal occurrences of soil erosion	Operation/Maintenance cost		
6. Siltation/ Water-logging								
6.1 Siltation/ Contamination	<ul style="list-style-type: none"> Regular visual checks shall be made to observe any incidence of blockade of drains. Regular checks shall be made for soil erosion. Monitoring of surface water bodies 	Project requirement	Near surface Water bodies	<p>MI: Water quality</p> <p>PT: No turbidity of surface water bodies due to the road</p>	Site observation	Included in Operation/Maintenance cost	BSRDCL	BSRDCL
6.2 Water logging due to blockage of drains, culverts or streams	<ul style="list-style-type: none"> BSRDCL shall ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/streams. Monitoring of waterborne diseases due to stagnant water bodies 	Project requirement IRC: SP:21-2009	All the CD structures near surface Water bodies/ cross drains/side drains	<p>MI: Presence/absence of water logging along the road</p> <p>PT: No record of overtopping/ Water logging</p>	Site observation	Included in Operation/Maintenance cost	BSRDCL	BSRDCL
7. Flora								
7.1 Vegetation	<ul style="list-style-type: none"> Planted trees, shrubs, and grasses to be properly maintained. The tree survival audit to be conducted at least once in a year to assess the 	Forest Conservation Act 1980	Project tree plantation sites	<p>MI: Tree/plants survival rate</p> <p>PT: Minimum rate of 80% tree</p>	Records and field observations.	Included in Operation/Maintenance cost	BSRDCL/N GO/ADB	BSRDCL

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
	effectiveness			survival	Information from Forestry Department			
8. Maintenance of Right of Way and Safety								
8.1 Accident Risk due to uncontrolled growth of vegetation	<ul style="list-style-type: none"> Maintain shoulder completely clear of vegetation. Minimum offset as prescribed in IRC: SP:21-2009 to be maintained Regular maintenance/trimming of plantation along the roadside No invasive plantation near the road. 	Project requirement IRC: SP:21-2009	Throughout the Project route	<u>MI</u> : Presence and extent of vegetation growth on either side of road. Number of accidents. <u>PT</u> : No accidents due to vegetation growth	Visual inspection Check accident records	Included in Operation/Maintenance cost	BSRDCL	BSRDCL
8.2 Accident risks associated with traffic movement.	<ul style="list-style-type: none"> Traffic control measures, including speed limits, will be enforced strictly. Further encroachment of encroachments within the ROW will be prevented. No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law Monitor/ensure that all safety provisions included in design and construction phase are properly maintained Highway patrol unit(s) for round the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. Tow-way facility for the breakdown vehicles if possible. 	IRC: SP:55-2014. IRC:67-2010 Project Design	Accident Prone Areas	<u>MI</u> : Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law <u>PT</u> : Fatal and non-fatal accident rate is reduced after improvement	Review accident records Site observations	Included in Operation/Maintenance cost	BSRDCL	BSRDCL

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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location/ Nos./ sections	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
8.3. Transport of Dangerous Goods	<ul style="list-style-type: none"> Existence of spill prevention and control and emergency responsive system Emergency plan for vehicles carrying hazardous material 	-	Throughout the project stretch	<p><u>MI</u>: Status of emergency system – whether operational or not</p> <p><u>PT</u>: Fully functional emergency system</p>	Review of spill prevention and emergency response plan Spill accident records	Included in Operation/Maintenance cost	BSRDCL	BSRDCL

ADB: Asian Development Bank, BSRDCL: Bihar State Road Development Corporation Ltd., EA: Executing Agency, CSC: Construction Supervision Consultant, CPCB: Central Pollution Control Board, CGWA: Central Groundwater Authority, CBR: California Bearing Ratio, DEIAA: District Environmental Impact Assessment Authority, EMP: Environmental Management Plan, EMOP: Environmental Monitoring Plan. EO: Environmental Officer, IRC: Indian Road Congress, MOEFCC: Ministry of Environment, Forests and Climate Change, MORTH: Ministry of Road Transport and Highways, NGO: Non-Governmental Organization, RP: Resettlement Plan

The “Project engineer” or “the engineer” is the team of Construction Supervision Consultants (CSC) responsible for approving the plans, engineering drawing, release of payments to contractor etc. on behalf of the employer (BSRDCL). It is usually the team leader of the CSC that takes the responsibility of signing approval documents on behalf of the CSC team. The “environmental officer” is the environmental specialist under the CSC who is responsible for providing recommendations to the CSC team leader for approving activities specific to environment safeguards on behalf of “the engineer”.

Supplementary Tables to EMP

Noise Sensitive Receptors and Proposed Noise Barriers

S. No	Chainage (km)	Name of Noise Sensitive Receptors	Side	Dist. of Boundary wall from PCL (m)	Dist. of Main structure from PCL (m)	Proposed Noise Barrier (m)
1.	17+400	Middle School, Kopariya	LHS	No wall	22	16
2.	22+100	Middle School, Mobarakpur	LHS	No wall	60	30
3.	24+000	Urdu Middle School	LHS	No wall	12	10
4.	24+100	Urdu Middle School	LHS	No wall	25	22
5.	26+200	Gayatri Education Niketan School	LHS	10	35	100
6.	26+300	Sudama Education Niketan School	LHS	No wall	7.3	N/A
7.	27+600	Middle School Makhana bazar	LHS	12.6	18.2	52
8.	26+000	Indian Public School	RHS	60	75	N/A
9.	26+700	Middle School Ganj	RHS	No wall	45	9
Total proposed Noise Barrier (Running Meter)						239

Water Bodies likely to be Affected along Project Road

S. No.	From Ch.	To Ch.	Dis. from PCL (m)	Name of water bodies	Type	Side	Nature	Usage
1.	17+700	17+800	25	Doma Pond	Pond	LHS	Non perennial	Domestic, cattle bathing, fishing, agriculture
2.	19+600	19+700	0	River (Dry)	River	LHS	Non perennial	Domestic, fishing, agriculture
3.	24+500	24+600	2.5	Kaima Pond	Pond	LHS	Non perennial	Domestic, fishing, agriculture
4.	25+800	25+900	40	Pond	Pond	LHS	Non perennial	Domestic, cattle bathing, fishing, agriculture
5.	18+400	18+500	0	Kopadiya River (Koshi)	River	RHS	Perennial	Domestic, cattle bathing, fishing, agriculture
6.	19+000	19+100	3	Canal	Canal	RHS	Non perennial	Fishing, agriculture
7.	23+500	23+600	3	Pond	Pond	RHS	Non perennial	Domestic, fishing
8.	25+300	25+400	32	Pond	Pond	RHS	Non perennial	Domestic, fishing, agriculture
9.	26+800	26+900	8	Khantar Das pond	Pond	RHS	Non perennial	Domestic, cattle bathing, fishing, agriculture
10.	27+200	27+300	5	Pond	Pond	RHS	Non perennial	Domestic, fishing
11.	27+300	27+400	45	Karbala Pond	Pond	RHS	Non perennial	Domestic, fishing

1.1 Performance Indicators

Environmental components identified of a particular significance in affecting the environment at critical locations have been suggested as performance indicators (PIs) and is given in **following Table:**

Performance Indicators and Monitoring Plan

S. No	Monitoring plan/ Performance Indicators	Description of Item	Indicator	Stage	Responsibility
1	Monitoring plan	<ul style="list-style-type: none"> No. of trees planted (Total) No. of trees under Compensatory Afforestation No. of Trees planted along Road sides 	Road side and other plantation areas	Post construction stage	Forest Department and BSRDCL
3	Performance indicators	<ul style="list-style-type: none"> No. of Borrow Areas identified and verified No. of sites for which restoration plans have been prepared No. of Sites restored and rehabilitated No. of sites handed over 	Borrow Area	Pre -Construction and Post- Construction	Contractor & BSRDCL
4	Performance indicators	<ul style="list-style-type: none"> No. of Quarry Areas identified and verified No. of sites for which restoration plans have been prepared No. of sites restored and rehabilitated No. of sites handed over 	Quarry	Pre –Construction and Post Construction	Contractor & BSRDCL
5	Performance indicators	<ul style="list-style-type: none"> Quantity of Debris and spoils to be disposed off No. of locations finalized for Debris disposal Quantity of Debris and spoils disposed off No. of locations for which Rehabilitation works have been completed 	Disposal sites	Construction and Post Construction	Contractor & BSRDCL
6	Performance indicators	<ul style="list-style-type: none"> No. of locations identified for the construction camp and construction plant sites No. of locations approved Lay-outs approved 	Construction camps and plant sites	Pre- construction and Post Construction	Contractor & BSRDCL

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S. No	Monitoring plan/ Performance Indicators	Description of Item	Indicator	Stage	Responsibility
		<ul style="list-style-type: none"> No. of sites for which site Restoration and Rehabilitation has been completed 			
7	Performance indicators	<ul style="list-style-type: none"> No. of Trees to be cut No. of Trees cut % Progress on the tree removal 	Tree cutting	Pre construction	BSRDCL
8	Performance indicators	<ul style="list-style-type: none"> No. of locations identified for temporary storage of the excavated materials to be used in embankment and sub grade 	Storage of excavated materials	Pre construction and construction	Contractor
9	Monitoring plan	<ul style="list-style-type: none"> Statutory environmental monitoring as per the conditions stipulated in the consents/ permission issued by PCB 	Environmental status at construction Sites	Construction	Contractor
10	Monitoring plan	<ul style="list-style-type: none"> Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring plan. 	Air, Noise, Soil and Water quality	Construction and Operation	Contractor/ BSRDCL through external agency
11	Monitoring plan	<ul style="list-style-type: none"> Before the onset of monsoon all the debris/excavated materials shall be cleaned from the work sites and disposed of at the pre-identified approved locations 	Silting of water bodies	Construction	Contractor supervised by the Environmental specialist of CSC
12	Performance indicators	<ul style="list-style-type: none"> Implementation of enhancement measures for Parking areas Cultural properties Religious properties 	Enhancements	Construction	Contractor
13	Performance indicators	No. of Training sessions organized for <ul style="list-style-type: none"> Department staff Contractors Combined No. of people trained Department staff Contractors 	Training Imparted	Construction and Operational Phase	BSRDCL
14	Performance indicators	Slope protection measures <ul style="list-style-type: none"> Length (by type) No. of Locations 	Work sites	Construction	Contractor
15	Performance indicators	Drainage <ul style="list-style-type: none"> Length 	Work sites	Construction	Contractor

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S. No	Monitoring plan/ Performance Indicators	Description of Item	Indicator	Stage	Responsibility
		<ul style="list-style-type: none"> No. of Locations 			
16	Performance indicators	Safety provisions <ul style="list-style-type: none"> Signage (by type and No.) Guard Rails Guide Rails 	Work sites	Construction	Contractor
17	Performance indicators	No. of chute drains provided	Work sites	Construction	Contractor
18	Performance indicators	Soil erosion prevention measures <ul style="list-style-type: none"> Silt fencing (No. of locations and quantity) Stone pitching (No. of locations and quantity) Any other (Grass seeding etc.,) 	Work sites	Construction	Contractor
19	Performance indicators	Utility ducts <ul style="list-style-type: none"> Length provided No. of Locations 	Utility ducts	Construction	Contractor
20	Performance indicators	Water sources <ul style="list-style-type: none"> No. of sources protected No. of sources relocated 	Work sites	Construction	Contractor
21	Performance indicators	No. of HIV awareness sessions conducted	Labours	Construction Stage	BSRDCL
22	Performance indicators	No. Safety awareness sessions conducted	Labours	Construction Stage	BSRDCL
23	Monitoring plan	No. of awareness sessions for educating the public about road safety and other environmental aspects (such as waste dumping, preservation of enhanced sites, pollution and health impacts etc.)	Public in the vicinity of project road.	Construction Stage	BSRDCL

ENVIRONMENTAL MONITORING PLAN

Environmental Monitoring of Ambient Air, Water, Noise and Soil along the Project Road

Environment Component	Project Stage	Regular Monitoring Parameters				Institutional Responsibilities				
		Parameters	Standards	Method/ Guidelines	Locations	Frequency	Duration	Action Plan in case criteria exceeds	Implementation	Supervision
Ambient Air	Construction	PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO	National Ambient Air Quality Standard (CPCB, 18 th Nov, 2009)	High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB	Plant site/ H.M.P/Stone Crusher/ (construction site)-Total 2 locations	Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 = 12)	Continuous 24 hours	Check and modify control device like bag filter/ cyclones of hot mix plant	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
		PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO		High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB	Along the project roads at 2 locations in consultation with CSC.	Once in a season excluding the monsoon for 2 years (No. of Samples = 3x2x2 = 12)	Continuous 24 hours	-	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
	Operation	PM ₁₀ µg/m ³ , PM _{2.5} µg/m ³ , SO ₂ , NO _x , CO		High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by CPCB	Along the project road at 2 locations in consultation with BSRDCL	In the interval of 4 months for 1 Year (No. of Samples = 3x2x1= 6)	Continuous 24 hours	-	BSRDCL through approved NABL monitoring agency	BSRDCL

Section-6: EMP

Environment Component	Project Stage	Regular Monitoring Parameters					Institutional Responsibilities			
		Parameters	Standards	Method/ Guidelines	Locations	Frequency	Duration	Action Plan in case criteria exceeds	Implementation	Supervision
Surface Water Quality	Construction	pH, Temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, Total Coliform	Freshwater Classification Criteria by CPCB for Propagation of Aquatic life	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	2 locations along the project road	Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 = 12)	Grab Sampling	Check and modify petrol interceptors, silt fencing devices	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
	Operation	pH, Temperature, DO, BOD, COD, Oil & Grease, Total Suspended Solid, turbidity, Total Hardness, Chlorine, Iron, Total Coliform		Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	2 locations identified by BSRDCL along the project roads	In the interval of 4 months for 1 Year (No. of Samples = 3x2x1 = 6)	Grab Sampling	Check and modify petrol interceptors, silt fencing devices	BSRDCL through approved NABL monitoring agency	BSRDCL
Ground Water Quality	Construction	pH, Temperature, TSS, Total hardness, Suspended Solid, Chlorine, Iron, Sulphate, Nitrate	Ground Water Quality Standard as per IS: 10500, 1991	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Plant, Camp site & Construction site (2 location)	Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 3x2x2 = 12)	Grab Sampling	Check and modify petrol interceptors, silt fencing devices	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
	Operation	pH, Temperature, TSS, Total hardness,		Grab sample collected from source and analyze as per	1 location identified by BSRDCL along the roads (1	In the interval of 4 months for 1 Year	Grab Sampling	Check and modify petrol interceptors, silt fencing devices	BSRDCL through approved NABL monitoring agency	BSRDCL

Section-6: EMP

Environment Component	Project Stage	Regular Monitoring Parameters					Institutional Responsibilities			
		Parameters	Standards	Method/ Guidelines	Locations	Frequency	Duration	Action Plan in case criteria exceeds	Implementation	Supervision
		Suspended Solid, Chlorine, Iron, Sulphate, Nitrate		Standard Methods for Examination of Water and Wastewater	location)	(No. of Samples = 3x1x1 = 3)				
Drinking water Quality	Construction	pH, Temperature, TSS, Total hardness, Suspended Solid, Chlorine, Iron, Sulphate, Nitrate Total coliform Faecal coliform	Drinking Water quality standard by CPCB/ IS:10500	Grab sample collected from drinking water source at camp site and construction site	2 location camp site and construction site	In the interval of 3 months for 2 Year (No. of Samples = 2x4x2 = 16)	Grab Sampling	Treatment of water/ identification of alternate source	Contractor through approved NABL monitoring agency	BSRDCL
Noise Level	Construction	Leq dB (A) (Day and Night) Average and Peak values	Ambient Noise Standard (CPCB, 2000)	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968 Using Noise level meter	1 location at plant site and 3 sensitive locations (school/ college/ hospital along the project road) during construction stage of the project road	Once in 3 month for 2 years excluding monsoon period) (No. of Samples = 4x3x2= 24)	Readings to be taken at 60 seconds interval for every hour and then Leq are to be obtained for Day time and Night time.	Check and modify equipment and devices used to attenuate noise level	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
	Operation	Leq dB (A) (Day and Night)		IS:4954-1968 as adopted by CPCB for	2 Location as identified by BSRDCL	In the interval of 4 months for 1	Readings to be taken at	-	BSRDCL through approved NABL monitoring agency	BSRDCL

Section-6: EMP

Environment Component	Project Stage	Regular Monitoring Parameters					Institutional Responsibilities			
		Parameters	Standards	Method/ Guidelines	Locations	Frequency	Duration	Action Plan in case criteria exceeds	Implementation	Supervision
		Average and Peak values		Identified Study Area CPCB/IS:4954-1968 Using Noise level meter		Year (No. of Samples = 2x3x1= 6)	60 seconds interval for every hour and then Leq are to be obtained for Day time and Night time.			
Soil	Construction	Physical Parameter: Texture, Grain Size, Gravel, Sand, Silt, Clay; Chemical Parameter: pH, Conductivity, Calcium, Magnesium, Sodium, Nitrogen, Adsorption Ratio	-	As specified by the site engineer BSRDC / CSC	Near Construction sites along the road as identified by the EO, CSC (2 location)	Once in 3 month for 2 years excluding monsoon period (No. of Samples = 2x3x2= 12)	Grab sampling	-	Contractor through approved NABL monitoring agency	EO of CSC and BSRDCL
Tree Plantation/ Green belt	Construction	Tree Survival rate	90% Tree Survival Rate	Visual checks and tree enumeration	Throughout the Project in substantially completed section	Once in a month	2 Years	Replacement of Dead tree with healthy saplings of same species, repairing of tree guards, fencing	Contractor/Forest Department	EO of CSC and BSRDCL

Section-6: EMP

Environment Component	Project Stage	Regular Monitoring Parameters					Institutional Responsibilities			
		Parameters	Standards	Method/ Guidelines	Locations	Frequency	Duration	Action Plan in case criteria exceeds	Implementation	Supervision
	Operation	Tree Survival rate	90% Tree Survival Rate	Visual checks and tree enumeration	Throughout the Project stretch	Once in three months	3 years	Replacement of Dead tree with healthy saplings of same species	BSRDCL	BSRDCL
Water Bodies	Construction	Turbidity in Storm water Silt load in ponds/Rivers	As specified by the engineer Water quality standards	Visual Checks	At the drains, Ponds, Water reservoir and River along the project road	Pre-monsoon and post monsoon seasons for 2 years	2 years	Inspection and modification of silt fencing/ any leakage of drains to these surface water bodies	Contractor	EO of CSC and BSRDCL
	Operation	Turbidity in Storm water Silt load in ponds	As specified by the engineer/ Water quality standards	Visual Checks	At major water bodies (Pond, within the Proposed ROW and those located at immediate vicinity of the Proposed ROW.	1 Years before onset of monsoon	2 Years	Check and repair catch drains, storm water drains and silt trap	BSRDCL	BSRDCL

**Accidental spillage of hazardous and non-hazardous substances needs to be dealt with as special cases largely depends on the circumstances including state of the substance (liquid or solid). Monitoring shall be carried out at all locations used for collection of primary data in the study.*

Environment Management Plan
(Mansi-Saharsa-Hardi-Chughara of SH-95 Pkg-4)
Km 14+125 to Km 28+080)

	Description	Unit	Quantity	Remarks
A.	Environmental Pollution Monitoring			
	Environmental Monitoring for air, water, noise and soil attributes			
1	Ambient air quality monitoring along the project road for particulate matter (PM _{2.5} and PM ₁₀), sulphur dioxide (SO ₂), oxides of nitrogen (NO _x); and carbon monoxides (CO) using standard analysis technique in accordance with the National Ambient Air Quality Standards formulated by MoEF&CC and the World Bank (IFC) Air Quality Standards	Nos.	30	These items shall be treated as incidental to the work and no separate payment shall be made for the same
2	Sound Pressure Level (SPL) measurements along the project road using standard analysis technique in accordance with the National Ambient Air Quality Standards in respect of noise formulated by MoEF&CC and the World Bank (IFC) Air Quality Standards	Nos.	30	
3	Soil Quality Testing along the project road in accordance with CPCB norms	Nos.	12	
4	Water Quality Testing for parameters as per IS: 10500-2012 along the road in accordance with CPCB norms (ground water and surface water samples)	Nos.	49	
B.	Environmental Mitigation Measures			
1	Dust suppression in haul roads, material storage location and all active locations @ 3 tanker per day for 200 days	Nos.	600	These items shall be treated as incidental to the work and no separate payment shall be made for the same
2	Bio Toilets in Construction Camp			
	Supply of D.R.D.O Technology Bio-Digester tanks Rota-molded double wall manufactured in automatic Rota-molding machines using superior grade Virgin LLDPE (Polymer) with 2.5% Carbon Black, UV Resistant Polymer leading to highest quality consistency. Thickness of the outer shell of minimum 6mm, partitions made from HDPE Polymer of 8mm thick. Immobilization Matrices of Heavy Duty Poly Grass PVC Matting lining along the partitions on both sides. Heavy duty pipes & fitting shall be used in these tanks of Finolex or equivalent make. Fasteners made of Brass shall be used inside the tank with manufacturer's test certificate and including AMI (Bacteria) of 600 liters per tank. Size of Tank: 2000 Litres capacity upto 20-30 users per day; Tank Diameter of 1425mm; Tank Height of 1600mm; Outlet pipe diameter 75mm; inlet pipe diameter 110mm.	Nos.	2	
	FRP Toilet Cabin IWC (Ceramic Pan) type of size 1250mm X 915mm X 2100mm with ± 5% tolerance.	Nos.	4	
	Installation Charges			
	i) Plumber (Skilled)	Nos.	1	
	ii) Plumber (Unskilled)	Nos.	1	
3	Providing solid waste management facility in construction camp, HDPE Garbage Container, Size: 940 X 480 X 550mm(LxWxD)	Nos.	6	
5	Oil trap/ interceptor at parking/ servicing of construction vehicles	Nos.	2	
6	Occupational safety appliances and PPEs for Covid-19	Month	24	
7	Silt Fencing near water bodies adjacent to road	Rm	1288	
8	Rainwater Harvesting Structures complete in all respect and conforming to the relevant specifications	Nos.	46	
9	Noise Barrier with hollow brick compound wall to 3.5m height using mortar, plastering and intermediate brick pillars viz; School at km 17+400 (LHS), km 22+100 (LHS), km 24+000 (LHS), km 24+100 (LHS), km 26+200 (LHS), km 27+600 (LHS) and km 26+700 (RHS).	Rm	239	
13	Informatory Signage for safety near noise sensitive locations and all built-up sections	Nos.	-	
14	Slope / Embankment protection with Turfing of embankment and Stone pitching	Sqm	-	
C	Environmental Enhancement Measures			
1	Provision for Color Lighting in important major Junctions and bus bays.	Nos.	20	
5	Enhancement of Road side community Pond at km 17.800 (LHS) and km 26.900 (RHS) shall be enhanced as ghat for domestic usage during construction stage (Stepped access (brickwork C.M. 1:4) or as specified by the engineer)	Rm	600	

Appendix D-2

Involuntary Resettlement Safeguard Principles for the Project

Based on the analysis of government provisions and ADB policy, the following resettlement principles are adopted for this Project :

Commencement of Civil Works

Wherever private land is involved, compensation for land should be paid to the land owner or into court deposit, in case of ownership/appointment issues exist, prior to commencement of civil works. In stretches where there is no land acquisition and all improvements are proposed with the right-of-way, all assistances should be paid to the DP prior to giving clearance for civil works. However, any long term rehabilitation measures like training for skill development and pension for life will continue for a longer period and such rehabilitation measures will not be a bar to commence civil works.

Appendix D-3

Resettlement Plan

April, 2023

IND: Bihar State Highways III Project (Phase-2)

**Fungo Halt-Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi-Chaughara Road
(SH-95) from KM 14+125 to KM 28+080 (Section-II) on EPC Mode**

Prepared by Bihar State Roads Development Corporation Limited (BSRDCL), Government of Bihar

CURRENCY EQUIVALENTS

(As of 31 December 2021)

Currency Unit	–	Indian Rupee (INR)
INR 1.00	=	0.013 USD
USD 1.00	=	INR 74.35

ABBREVIATIONS

ADB	–	Asian Development Bank
BSR	–	Basic Schedule of Rates
DC	–	District Collector
DP	–	Displaced person
EA	–	Executing Agency
GOI	–	Government of India
GRC	–	Grievance Redressal Committee
IA	–	Implementing Agency
IAY	–	Indira Aawas Yojana
IPP	–	Indigenous Peoples Plan
LA	–	Land acquisition
DLAO	–	District Land Acquisition Officer
RFCT in LARR Act-2013	–	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
LVC	–	Land Valuation Committee
MORTH	–	Ministry of Road Transport and Highways
NGO	–	Nongovernment organization
NRRP	–	National Rehabilitation and Resettlement Policy, 2007
PD	–	Project Director

PIU	–	Project implementation unit
R&R	–	Resettlement and rehabilitation
RO	–	Resettlement Officer
ROW	–	Right-of-way
RP	–	Resettlement plan
SC	–	Scheduled caste
SH	–	State highway
SPS	–	Safeguard Policy Statement
ST	–	Scheduled tribe

This Resettlement Plan (RP) is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

Glossary

Cut-off Date: For titleholders in case of land acquisition, the date of publication of preliminary notification for acquisition under section 11 of the RFCT in LARR Act – 2013, is treated as the cut-off date. In case of non-titleholders, the date of start of census survey is the cut-off date.

Displaced Persons: In the context of involuntary resettlement, displaced persons are those who are physically displaced (relocation, loss of residential land, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Economic Displacement: Loss of land, assets, access to assets, income sources, or means of livelihoods as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Insignificant Impact: Where the impact on land is less than 10 percent of the total area or impact on structure is partial and does not required relocation.

Meaningful Consultation: A process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

Physical Displacement: Relocation, loss of residential land, or loss of shelter as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.

Vulnerable groups: include below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land.

Significant Impact. Landowners losing shelter and required relocation or losing more than 10% of their productive assets.

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EXECUTIVE SUMMARY

1. Project Description

1. The Bihar State Road Development Corporation Limited (BSRDCL), Government of Bihar is planning to upgrade State Highway number 95 (Mansi-Saharsa-Hardi Chughara Road) from existing single/intermediate lane to double lane with total road length of 28.08 km in Khagaria and Saharsa districts and requested ADB for financing of the project. This RP for two-lane road project is prepared based on the detailed design report prepared by BSRDCL. The RP complies with the applicable State Government, Government of India, and ADB policy and legal framework. This project is considered as Category A⁴ for Involuntary Resettlement (IR) per ADB's Safeguard Policy Statement (SPS 2009).

2. The proposed 2-lane road, predominantly traverses through plain terrain, starts from the T-junction with NH-31 at km 276+200 of NH-31 at Manasi in Khagaria district and ends at Km.28.08 near Bharara village in Saharsa district. The land use along the project road includes agriculture land, residential use, and commercial areas. The project aims to provide smooth traffic movement for the escalating traffic and enhance capacity and improved services to alleviate the likely capacity constraints to be generated after the future development in the region. The project on its implementation would increase the physical infrastructure and boost the economic growth in the region.

3. Scope of Land Acquisition and Resettlement

4. As per the technical design, the roadway width proposed for 2-lane carriageway with paved shoulder is 12.00 mtr. The existing Right of Way, as per the government records, is 0 to 35 mtr. The road has a bypass/missing link where government land is not available and hence, private land will be acquired with proposed RoW of 45 mtr. The proposed centerline is designed such that minimal land acquisition is required. The project impact assessed through project census survey includes loss of land and non-land assets and loss of livelihoods. It was found that 67.77 acre of private land and 570 structures owned by 665 households will be affected. The affected households are both titleholders and non-titleholders i.e encroachers and squatters. A full census survey was carried out to identify the persons who would be displaced by the project and the summary findings are presented in the following Table 1.

Table 1: Summary Project Impacts

Sl. No.	Impacts	Number
1	Area of private land to be acquired (in Acres)	67.77
2	Total number of private structures affected	570

⁴ ADB Safeguard Policy Statement Operations Manual Section F1: Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

Sl. No.	Impacts	Number
3	Total number of displaced households	665
4	Total number of displaced persons	4563
5	Total number of economically displaced households	429
6	Total number of physically displaced households	223
7	Total number of economically and physically displaced household	13
8	Total number of vulnerable households displaced	553
9	Total number of CPR (structure) affected	2 ^o

5. Socioeconomic Information and Profile

6. The social stratification of the project area shows the dominance of other backward caste (OBC) population with 514 (79.2%) households. There are 4563 displaced persons in total, which includes 2619 (57%) males and 1944 (43%) females. The average household size is 7 and the sex ratio among DPs is 742. According to project census survey there are 553 vulnerable households affected by the project. The educational status of DPs reveals that 45.26% DPs are still illiterate in the project area. Not a single scheduled tribe (ST) household is found to be affected under this subproject.

7. Stakeholders Consultation and Participation

8. Public consultations were conducted at 5 locations attended by 175 persons (77 male and 98 female) in the project to ensure peoples' participation during the project census survey. The male and females were consulted in separate 5 consultation meetings. Aiming at promotion of public understanding and fruitful solutions of developmental problems such as local needs and problem and prospects of resettlement, various sections of DPs and other stakeholders were consulted through focus group discussions and individual interviews. Several additional rounds of consultations with DPs and communities will form part of the further stages of project preparation and implementation. The RP implementing agency will be entrusted with the task of conducting these consultations during RP implementation, which will involve disclosure on compensation, assistance options, and entitlement package and income restoration measures suggested for the project.

9. To keep more transparency in planning and for further active involvement of DPs and other stakeholders the project information will be disseminated through disclosure of resettlement planning documents. The EA will provide relevant resettlement information, including information from the above-mentioned documents in a timely manner, in an accessible place and in a form and language(s) understandable to displaced persons and other stakeholders.

10. Legal Framework

11. The legal framework and principles adopted for addressing resettlement issues in the Project have been guided by the existing legislation and policies of the GOI, the Government of Bihar and Asian Development Bank. Prior to the preparation of the RP, a detailed analysis of the existing national and state policies was undertaken and an entitlement matrix has been prepared for the project. This RP is prepared based on the review and analysis of all applicable legal and policy frameworks of the country and ADB policy requirements. The gaps between the policies have been identified and addressed to ensure that the RP adheres to the SPS (2009) requirements.

12. All compensation and other assistances will be paid to all DPs prior to commencement of civil works. After payment of compensation, DPs would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. The value of salvaged materials will not be deducted from the overall compensation amount due to the DPs. A notice to that effect will be issued intimating that DPs can take away the materials.

13. Entitlements, Assistance and Benefits

14. For titleholders in case of land acquisition, the date of publication of preliminary notification for acquisition under section 11 of the RFCT in LARR Act – 2013 will be treated as the cut-off date. For non-titleholders, the cut-off date will be the start of the census survey which is 17 November 2021 in case of SH-95. The structures affected under the project will be compensated at replacement cost. DPs who settle in the affected areas after the cut-off date will not be eligible for compensation. They, however, will be given sufficient advance notice, requested to vacate premises and dismantle affected structures prior to project implementation. Their dismantled structures materials will not be confiscated and they will not pay any fine or suffer any sanction.

15. Relocation of Housing and Settlements

16. There are 236 households will be losing their shelter and therefore, require relocation. The IA will provide adequate and appropriate cash compensation at full replacement cost to the titleholders for their lost land and structures including eligible relocation assistance. The IA will compensate to the non-titleholders for the loss of assets other than land, such as dwellings, and also for other improvements to the land, at full replacement cost with eligible assistance. The entitlements to the non-titleholders will be given only if they occupied the land or structures in the project area prior to the cut-off date.

17. Income Restoration and Rehabilitation

18. The project impact reveals that due to loss of land and commercial structures, 371 households are losing their livelihood under the project. The entitlement proposed for the project has adequate

provisions for restoration of livelihood of the affected communities. The focus of restoration of livelihoods is to ensure that the DPs are able to at least achieve national minimum standards. To restore and enhance the economic conditions of the DPs, certain income generation and income restoration programs are incorporated in the RP. To begin with providing employment to the local people during the construction phase will enable them to benefit from the project, reduce the size of intrusive work forces and keep more of the resources spent on the project in the local economy. It will also give the local communities a greater stake and sense of ownership in the project.

19. Resettlement Budget and Financing Plan

20. The resettlement cost estimate for this project includes eligible compensation, resettlement assistance and support cost for RP implementation. The support cost, which includes staffing requirement, monitoring and reporting, involvement of RP implementing agency in project implementation and other administrative expenses are part of the overall project cost. Contingency provisions have also been made to take into account variations from this estimate. The total budget for the proposed project RP is Rs 714.3 million.

21. Grievance Redressal Mechanism

22. A Grievance Redressal Committee (GRC) will be established at the district level with the primary objective of providing a mechanism to mediate conflict and cut down on lengthy litigation. It will also provide people, who might have objections or concerns about their assistance, a public forum to raise their objections and through conflict resolution, address these issues adequately. The GRC will be headed by the District Collector (DC) or his designated representative. The GRC will have representative from the PIU, representative of APs, particularly of vulnerable DPs, local government representative, representative of local NGOs and other interest groups as felt necessary. All Grievances will be routed through the RP implementing agency to the GRC. The RP implementing agency will act as an in-built grievance redress body. The RP implementing agency will first of all register the grievances and take up with VLC for redress and any grievances not redressed at VLC level will be dealt in by the GRC. Grievances will be redressed within two to four weeks from the date of lodging the complaints, depending on severity of problem. However, an aggrieved person will have access to the country's judiciary at any stage of the project level grievance redress process. Taking grievances to Judiciary will be avoided as far possible and the RP implementing agency will make utmost efforts at reconciliation at the level of GRC.

23. Institutional Arrangement

24. The Executing Agency (EA) for the Project is BSRDC, Government of Bihar. The existing BSRDC has already set up a Project Implementation Unit (PIU) headed by a Deputy General Manager (DGM) assisted by Managers. This office will be functional for the whole Project duration. The PIU will hire an RP implementing agency for supporting it in implementation of R&R activities. The staffs at the PIU level will be provided with the training by the social/ resettlement specialist of the supervision consultant for

implementation of the RP. Many of the BSRDCL staffs are already having prior experience of implementing RP under previous projects and further to enhance their capacity, a training/workshop will be conducted under the project involving other implementing support agencies.

25. Implementation Schedule

26. Implementation of RP mainly consists of compensation to be paid for affected structures and rehabilitation and resettlement activities. The time for implementation of resettlement plan will be scheduled as per the overall project implementation. The civil works contract for each project will only be awarded after all compensation and relocation has been completed for project and rehabilitation measures are in place. The proposed project R&R activities are divided in to three broad categories based on the stages of work and process of implementation such as Project Preparation phase, RP Implementation phase and Monitoring and Reporting phase.

27. Monitoring and Reporting

28. RP implementation for the project by the RP implementing agency will be closely monitored by the EA. Keeping in view the significance of resettlement impacts of the overall project, the monitoring mechanism for this project will have both internal monitoring by PIU and external monitoring by an external expert. PIU responsible for supervision and implementation of the RP will prepare monthly progress reports on resettlement activities and submit to PIU. PIU will submit semi-annual RP monitoring reports to ADB. The external monitoring expert responsible for monitoring of the RP implementation will submit a semi-annual review report to EA and ADB to determine whether resettlement goals have been achieved, more importantly whether livelihoods and living standards have been restored/ enhanced and suggest suitable recommendations for improvement.

1. PROJECT DESCRIPTION

Introduction

1. Bihar has experienced consistent socio-economic development over the last decade with an economic growth rate of 15.01 % at current prices in year 2018-19 which is higher than the growth rate for the Indian economy.⁵ Significant improvement in road infrastructure has led to a cumulative growth in all sectors like agriculture, labor, employment, trade and manufacturing resulting in an increased per capita income from Rs. 21,750 in 2011-12 to Rs 30,617 in 2018-19. However, Bihar remains as 5th low-income state of India along with 34% of population living below poverty line⁶

2. The aim of Sustainable Development Goal-9 (SDG 9) is to develop quality and resilient infrastructure at the regional and transborder levels. The available and accessible infrastructure is an important driver for economic development. Infrastructure complements economic growth and vice versa. For instance, the development of transport infrastructure expands the scope and size of the market and also improves productivity significantly; on the other hand, economic growth enables the state to create more infrastructure. Apart from ensuring better economic growth prospect, integration of local markets with the global market, technological innovation, and the progress in infrastructure also help in reducing poverty.

3. The economy of Bihar is mainly based on agricultural and trading activities. The industrial and agricultural developments have led to higher transport demand. With the higher transport demand and the expansion of the existing business, there is a growing mismatch between the vehicular population and availability of road infrastructure, which has resulted in traffic congestions, deteriorated level of traffic efficiency and road safety. As a result of the aforementioned growth and need to fulfill the mismatch, various new infrastructure development projects have been planned across the state. The Government of Bihar acting through Bihar State Road Development Corporation Limited (BSRDCL) has taken the needful action.

4. The road master plan⁷ prepared by State Government of Bihar under ADB-supported TA-8170 estimates that \$15.8 billion is required in capital expenditure for road improvements by 2035. Following this plan, BSRDC through the Government of Bihar, posed a proposal to ADB to take up a set of state roads for upgrading into two-lanes with paved shoulders. For the proposed sub project road, State Government of Bihar will be the Executing Agency (EA) and the Implementing Agency (IA) will be the BSRDCL. A Project Implementation Units (PIU) is established for the project and they are responsible for conducting the social assessment and formulating Resettlement Plan (RP) for the project.

Project Description

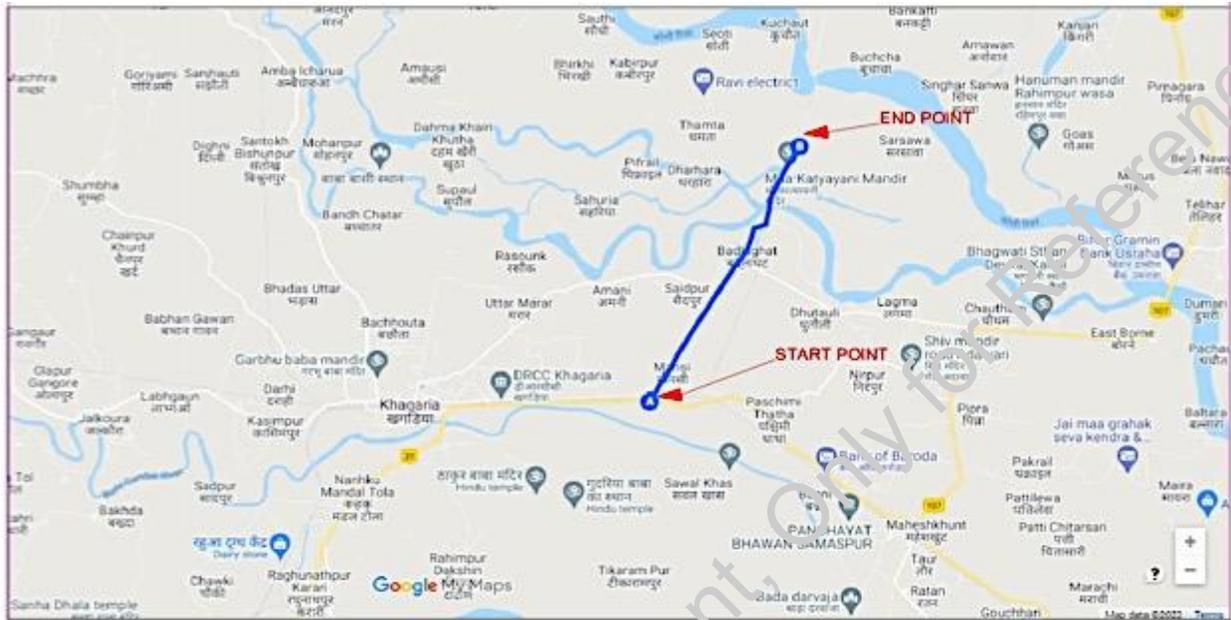
5 Bihar Economic Survey 2019 – 20, Finance Department, Government of Bihar

6 Bihar: Poverty, Growth & Inequality, World Bank Group, May 2016

7 Road Master Plan for Bihar's State Highway Development (2015-2035). Prepared under TA-8170 with Loan 2894- IND "India: Bihar State Highways II Project — Additional Financing."

5. The SH-95 (Mansi-Sahrsa-Hardi Chughara) Road Project proposed under Phase-II of BSHP-III is located in the Khagaria and Saharsa districts of Bihar. The Project Road predominantly traverses through plain terrain, starts from the T-junction with NH-31 at km 276+200 of NH-31 at Mansi in Khagaria district and ends at Km.28.08 near Bharara village in Saharsa district. There is no clear physical demarcation of the existing right of way at site. As per information provided by BSRDC, RoW is 35 mtr. in existing alignment and 45 mtr. in the greenfield. The project location map is presented in **Figure 1**.

Figure 1: Location Map of Project Road



6. The total road length is 28.080 kms with single lane (width-3.75 mtr) specification. The sub project road starts at km 0.000 from NH 31 at Mansi village in Khagaria district and ends near Bharara village. The land use along the project road is predominantly agricultural and residential except the 6.81km which runs through the basin of Bagmati, Katyani and Koshi rivers. Project road passes through 14 settlement/villages as presented in following **Table 2**.

Table 2: List of Project Affected Villages

S.No	Project Villages/ Settlements	Name of District	Name of Block	Chainage (km)	
				From	To
1	Mansi (Knutia)	Khagaria	Mansi	0+300	2+000
2	Saidpur	Khagaria	Mansi	3+300	3+400
3	Balha	Khagaria	Mansi	5+000	6+400

S.No	Project Villages/ Settlements	Name of District	Name of Block	Chainage (km)	
				From	To
4	Khirnia	Khagaria	Chautham	6+500	7+700
5	Hardiya	Khagaria	Chautham	7+700	8+600
6	Dighari	Khagaria	Chautham	8+600	10+700
7	Dhamahara	Khagaria	Chautham	10+700	13+600
8	Buchcha (Dhanchhar)	Khagaria	Chautham	13+600	14+500
9	Kopadiya	Saharsa	Salakhua	16+300	18+200
10	Mobarakpur	Saharsa	Salakhua	22+000	22+300
11	Gurgawan	Saharsa	Salakhua	23+100	24+100
12	Gouspur	Saharsa	Salakhua	24+000	24+900
13	Simri Bakhtiyarpur	Saharsa	Simri Bakhtiyarpur	25+000	27+400
14	Bharara	Saharsa	Simri Bakhtiyarpur	27+400	27+600

Source: Census Survey, September- December, 2021

7. The proposed road alignment provides a direct connectivity to the traffic plying between Khagaria to Saharsa, Supaul and Madhepura and surrounding area and vice versa, in turn saving travel time, relieving congestion on NH-31 and NH-107 and acting as a catalyst for Rapid development of Manasi, Simri Bakhtiyarpur, Saharsa, Hardi and Chaughara and other areas of the Khagaria, Saharsa and Supaul districts of state of Bihar. The road aims to provide smooth traffic movement for the escalating traffic and enhance capacity and improved services to alleviate the likely capacity constraints to be generated after the future development in the region. The project on its implementation would increase the physical infrastructure and boost the economic growth in the region.

8. This RP for 95 (Manasi, Saharsa-Hardi Chughara) Road subproject is prepared based on the detailed design report prepared by BSRDCL. The RP complies with the applicable State Government, Government of India and ADB policy and legal framework. This project is considered as Category A⁸ for Involuntary Resettlement (IR) as per the ADB Safeguard Policy Statement (SPS 2009).

General Profile of the Project Area

8 According to ADB Safeguard Policy Statement (SPS-2009), Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

9. The project area consists of two districts of Bihar i.e., Khagaria and Saharsa. Brief profile of the districts is narrated below.

10. **Khagaria** district in Bihar was previously a subdivision of Munger district and created as a separate district in 1981. The district occupies the area of 1485.8sq.km and is surrounded by seven rivers namely Ganges, Kamla balan, Koshi, Budhi Gandak, Karch, Kali Koshi and Bagmati. Administratively, the district is divided into two subdivisions- Khagaria and Gogri and 7 development blocks. There are total 306 revenue villages and 129 panchayats. The district is economically poor and receiving funds from the Backward Regions Grant Fund Program (BRGF).

11. As per the Census 2011, Khagaria district had total population of 1,666,886 persons. Out of which 883,786 are males while 783,100 are females. In 2011 there were total 328,823 families residing in Khagaria district. The Average Sex Ratio of Khagaria district is 886. Out of total population, 5.2% people live in urban areas while 94.8% lives in the rural areas. The literacy rate of the district is found to be 57.92%. The male literacy rate is 52.18% and the female literacy rate is 39.19%. The literacy rate in urban areas and rural areas is 76.7% and 56.8% respectively.

12. Wheat is the prominent rabi crop in alluvial soil of the district. Due to floods and water logging, the paddy production is very low, except in the southern part of the district. Maize is grown abundantly almost throughout the district, while banana cultivation as a cash crop has grown into prominence in last two decades. Banana cultivation is done mostly in Choutham, Gogari and Parvatta blocks. Apart from these mango and litchi orchards are abundant in this district and are found almost throughout the entire area. Trade and commerce are the only non- agricultural economic activity in the district. Khagaria and Gogri Jamalpur are the two important trade centers. Main trading item is food grains. Apart from food grains there are small number of traders in other items, as, textiles, hardware, jewelry and other commonly used items.

13. **Saharsa** is located in the Mithila region, one of the earliest centres of Brahminical civilization in India. Earlier, the Saharsa district was part of the Munger and Bhagalpur districts. Saharsa district occupies an area of 1,687 square kilometers. Saharsa district is surrounded on the west by the river Kosi, an abundance of fish and makhana. Saharsa district is divided into two Sub-Divisions namely Saharsa Sadar and Simri Bakhtiyarpur, 10 development blocks comprising total 151 village panchayats. Saharsa town is the administrative headquarters of this district.

14. According to census 2011, Saharsa district had total population of 1,900,661, out of which 997,174 are males while 903,487 are females. In 2011 there were total 368,979 families residing in Saharsa district. The average Sex Ratio of Saharsa district is 906. The population density of the district is found to be 1,127 people per square kilometer. The urban and rural composition of the population is 8.2% and 91.3% respectively. The total literacy rate of Saharsa district is 53.2%. The male literacy rate is 50.78% and the female literacy rate is 33.05%.

15. Saharsa and its surrounding areas occupy a flat alluvial plain forming part of the Kosi river basin. The city lies in the Kosi alluvial megafan, one of the largest alluvial fans in the world. The land is very fertile but frequent changes in the course of the Kosi, one of the largest tributaries of the Ganges, have led to the problems associated with soil erosion. Flooding is a major reason for the poor connectivity of the area; bridges are often washed away. Major flooding occurs almost annually, causing a significant loss of life and property. It is a major producer of best quality of Corn and Makhana in India. Every year 2 lakhs tones of each corn and Makhana are exported to different countries. The other crops grown in the region are rice, mangoes, litchi, bamboo, mustard, wheat and sugarcane.

Table 3: Demographic Indicators of Project Districts and State

Indicators	Bihar	Khagaria	Saharsa
Total Population	104,099,452	1,666,886	1,900,661
Rural Population	88.7%	94.8%	91.8%
Urban Population	11.3%	5.2%	8.2%
Area (Sq.Km.)	94,163	1,486	1,687
Population Density/Km ²	1,106	1,122	1,127
Sex Ratio	918	825	906
Literacy %	61.8	57.92	53.2%
Schedule Tribe	1.28%	0.04%	0.3%

Source: Census of India, 2011

Project Impacts and Benefits

16. The proposed project can be viewed as boosting economic growth and poverty reduction which will bring substantial social and economic development to the region. The social benefits arising due to the project will be triggered due to improved accessibility to various services such as to markets, health facilities, schools, and workplace, which in turn increases the income of the local residents, and ultimately elevating their standard of living. The possible direct and indirect positive impacts of the project are listed below.

1. The immediate benefits of road construction and improvement will come in the form of direct employment opportunities for the roadside communities and specially those who are engaged as wage laborers, petty contractors and suppliers of raw materials.
2. Improved road network will provide for improved linkages between the village communities and urban center, which provides wider marketing facilities.
3. Road network will not only link the village communities to better markets, but also open up wider work opportunities in distant places. People can shuttle to distant work sites and towns and engage in construction, factories, business as well as domestic works.

4. Improved road network will encourage urban entrepreneurs to invest in far and remote areas in commercial farming and industrial activities.
5. Improved road will also help people building strong institutional network with outside agencies. Essential and emergency services like schools, health center, public distribution system etc. can be availed faster.
6. Increased frequency of interaction with outsiders will increase the awareness level of the people in the village with regard to their health and nutrition, living style, value of education and proper utilization of available resources.
7. Interaction with the government, non-government and other development agents will help people gain new knowledge on improved farming, land development, development and maintenance of natural resources through the formation of various economic and social development groups.

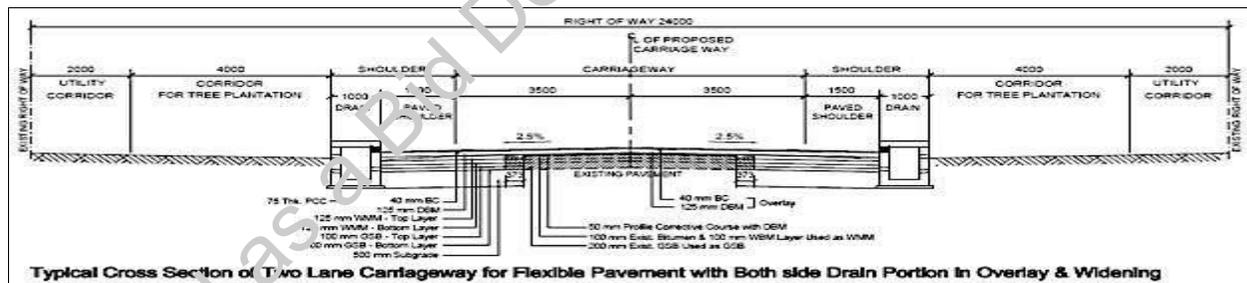
Minimizing Resettlement

8. Adequate attention has been given during the feasibility and detailed design phases of the project preparation to minimize the adverse impact on land acquisition and resettlement. However, technical and engineering constraints were one of the major concerns during exploration of various alternatives, especially in relations to road safety and decreasing congestion in key sections.

9. The inventory data and typical cross-sections formed the basis of determining the widening requirement. Based on this information along with presence of buildings, trees, utility services along the project road, the centerline of the alignment is designed so as to cause minimum disturbance to existing features. The existing RoW, as per the government records is 35 mts in existing alignment. The PRow required in greenfield is 45 mts. Having green field alignment and acquisition is envisaged under the subproject.

10. The pictorial view of the proposed 2-lane typical cross section is given in **Figure 2**. The carriage way width of 7m is proposed with 2×1.5m paved shoulder and 2×1m earthen shoulder. Lined drain of RCC is proposed in urban areas.

Figure 2: Typical Cross Section of The Road



Scope and Objective of Resettlement Plan (RP)

11. The aim of this Resettlement Plan (RP) is to mitigate all such unavoidable negative impacts caused due to the project and resettle the displaced persons and restore their livelihoods. This RP has been prepared on the basis of project census survey findings and consultation with various stakeholders. The plan complies with ADB Safeguard Policy Statement, 2009 designed by ADB to protect the rights of

the displaced persons and communities. The issues identified and addressed in this document are as follows:

1. Type and extent of loss of land and non-land assets, loss of livelihood, loss of common property resources and social infrastructure;
2. Impacts on indigenous people, vulnerable groups like poor, women and other disadvantaged sections of society
3. Public consultation and peoples' participation in the project;
4. Existing legal and administrative framework and formulation of resettlement policy for the project;
5. Preparation of entitlement matrix, formulation of relocation strategy and restoration of businesses/income;
6. R&R cost estimate including provision for fund and;
7. Institutional framework for the implementation of the plan, including grievance redress mechanism and monitoring & reporting.

Methodology for Resettlement Plan

8. For preparation of this RP, a detailed social impact assessment of the project road was carried out including resettlement screening, land acquisition planning, project census survey of affected assets and households and public consultation meetings. The details of methodology adopted for the social impact assessment is discussed in the following section.

1. Resettlement Screening

2. A social screening exercise was performed through a reconnaissance survey to gather firsthand information on impact on land acquisition and resettlement with specific attention on land use, presence of legal and/or illegal housing, traffic patterns, cultural resources, urban settlements and other sensitive areas. The aim of reconnaissance survey was to assess the scope of land acquisition and resettlement study and accordingly the detailed plan of action was prepared for the preparation of resettlement plan.

3. Resettlement Planning

4. The alignment was finalized as per the detailed engineering design. Initially, the numbers of affected villages were identified as per the alignment and availability of government land was confirmed from the revenue department. Following finalization of the road alignment, cross-sections design and land acquisition requirements, census of all displaced persons (DPs) was carried out in the project. The objective of the project census survey was to identify the persons who would be displaced by the project and to make an inventory of their assets that would be lost to the project, which would be the basis of calculation of compensation.

5. A structured census questionnaire (**Appendix 1**) was used to collect detailed information on affected households/ properties for a full understanding of impacts in order to develop mitigation measures and resettlement plan for the DPs. The survey team was selected locally including some female familiar with local languages and the team was trained by the resettlement specialist and the survey was closely monitored on a regular basis. Additionally, socio-economic data was also collected from the affected households. The census survey includes the following:

1. Inventory of the 100% non-land assets
2. Categorization and measurements of potential loss
3. Physical measurements of the affected assets/structures
4. Identification of trees and crops
5. Collection of information on social, economic and demographic profile
6. Identification of non-titleholders
7. Assessment of potential economic and livelihood impact

8. Public Consultation

9. To ensure peoples' participation in the planning phase and aiming at promotion of public understanding and fruitful solutions of developmental problems such as local needs of road users and problem and prospects of resettlement, various sections of displaced persons (DPs) and other stakeholders were consulted through focus group discussions, individual interviews and formal and informal consultations. The vulnerable sections of DPs and women were also included in this consultation process.

2. SCOPE OF LAND ACQUISITION AND RESETTLEMENT

1. Land Acquisition Requirement

2. It is proposed to develop the existing single lane with missing link road to 2-lane carriageway with paved shoulders. The road formation width proposed for 2-lane carriageway with paved shoulder is only 12.00 m. The existing Right of Way, as verified from the government records is 35 mts. Due to construction of a bypass/missing link in greenfield the PRow required is 45 mts. Due to having greenfield alignment a LAP has been prepared by BSRDCL to acquire private land and therefore the acquisition of private land will impact both titleholder (TH) in addition to non-titleholder (NTH) under this road subproject.

3. As per the LAP prepared for the proposed Project and R&R survey conducted, 79.17 acre of land need to be acquired under this project. The analysis of land acquisition requirement for the project shows that out of total land required for the project 67.77 acre (85.6%) of land is private land, 10.59 acre (13.38%) is government land and 0.81 acre (1.02%) is religious land. Acquisition of land will affect a total of 242 households. The land acquisition requirement for the project is presented in the **Table 4**.

Table 4: Land Acquisition Requirements under the Project

Sl. No.	Type of Ownership	DH	Area (in. Acre)	%
1	Private Revenue	242	67.77	85.60
3	Government	0	10.59	13.38
4	Religious	0	0.81	1.02
5	Community	0	0.00	0.00
Total		242	79.17	100.00

4. Resettlement Impacts

5. Based on the above requirement, the project impact assessed through project census survey includes loss of land, loss of non-land assets and loss of livelihoods. Other than this, non-land assets known as common properties resources (CPR) including religious, and community ownership are also assessed to be affected by the proposed project.

6. A project census survey was carried out to identify the persons who would be displaced by the project and to make an inventory of their assets that would be lost due to the project, which would be the basis of calculation of compensation. The census survey of proposed SH-95 was carried out in between 17 November 2021 and 5 January 2022. Before start of census survey, a videography was also done on the entire stretch to cover the existing road conditions and structures/buildings within the RoW. For titleholders, the date of publication of preliminary notification for acquisition of land under section 11 of the RFTCT in LARR Act – 2013 will be treated as the cut-off date. The start day of project census survey is the cut-off date for non-titleholders eligible for compensation and assistance under the project. It was found that a total 665 households (649 losing land, structure or both and 16 tenants

losing their livelihood would be displaced by this sub project. The details are being provided in the **Table 5 and 6.**

Table 5: Loss of Property and Number of Displaced Households

Sl. No.	Category of Loss	No. of Household	%
1	Land with Structure	53	7.97
2	Only Structure	407	61.20
3	Only Land	189	28.42
4	Other DPs (Tenant)	16	2.41
Total		665	100.00

7. It was found that a total of 223 households will be physically displaced due to loss of residential structure. Among them 44 are TH and 179 are NTH. Similarly, 429 households will be economically displaced due to loss of land parcel or commercial structures. These include 217 TH and 212 NTH. There are a total 13 household who will be displaced physically and economically include 5 TH and 8 NTH. A summary on category wise displacement of households is given in **Table 5.** The list of DPs is attached as **Appendix-2**, and photo identification of DPs is given in **Appendix 6.** The findings and magnitude of impacts are discussed in the following sections.

Table 6: Category wise Displacement of Households

Sl. No.	Category of Impact	No. of Household	%	TH	NTH
Physically Displaced Households					
1	Owners of Residential Structure	223	100	44	179
2	Residential Tenant	0	0	0	0
Total		223	100	44	179
Economically Displaced Households					
1	Owners of Agricultural Land	189	44.06	189	0
2	Agricultural Labourer	0	0.00	0	0
3	Agricultural Tenants/ Leaseholders	0	0.00	0	0
4	Sharecropper	0	0.00	0	0

5	Loss of Commercial Structure	153	35.66	3	150
6	Commercial Tenants	16	3.73	0	16
7	Employees in Structures	0	0.00	0	0
8	Other Private	71	16.55	25	46
Total		429	100.00	217	212
Physically and Economically Displaced Households					
1	Owners of Resi+ Commerical Structure	13	100	5	8
Total		13	100	5	8
Grand Total		665	100	266	399

8. Loss of Private Land in the Project

9. The land acquisition for the project will affect 242 titleholder households and the area of acquisition will be a total of 67.77 acre. Out of total affected land 92.16% is agriculture land affecting a total 221 households as shown in the **Table 7**.

Table 7: Type of Affected Private Land

Sl. No.	Type of Land	DH	Area (in Acre)	%
1	Irrigated	221	62.46	92.16
2	Residential	21	5.31	7.84
Total		242	67.77	100.00

10. The land to be acquired under the Project is under various use. It includes 50.58 acre of land being used by 171 households for agriculture, 0.42 acre for orchard by 2 households, 16.76 acre of land being used by 68 households for residential purpose and 0.03 acre of land by only one household for not any specific purpose as shown in the **Table 8**.

Table 8: Use of Affected Private Land

Sl. No.	Land Use Type	DH	Area (in Acre)	%
1	Cultivation	171	50.58	74.63
2	Orchard	2	0.42	0.62
3	Residential	68	16.76	24.72

4	Commercial	0	0.00	0.00
5	Forestation	0	0.00	0.00
6	No Use/Barren	0	0.00	0.00
7	Other	1	0.02	0.03
Total		242	67.77	100.00

11. The total land (67.77 acre) under acquisition belong to titleholders only. The ownership is of both single and joint type. It was found that to a maximum 76.45% displaced households have single ownership on the affected plot. The details of private land ownership are provided below in **Table 9**.

Table 9: Type of Private Land Ownership

Sl. No.	Type of Ownership	No. of Household	%
1	Single	185	76.45
2	Joint	57	23.55
3	Other	0	0.00
Total		242	100.00

12. Magnitude of Impact on Land in the Project

13. The survey revealed that 90 (37%) households are losing less than 10 % of their land parcel and therefore, the impact is non-significant as per ADP's SPS. The other 152 (63%) households are losing more than 10% of their productive asset and hence, the impact is significant. The proportion of significantly impacted DPs is high mainly due to acquisition of private land in greenfield area of proposed alignment. The details are provided in **Table 10**.

Table 10: Magnitude of Impact and Displaced Households

Sl. No.	Scale of impact	No. of Household	%
1	Up to 10%	90	37.19
2	Above 10% and Below 25%	76	31.40
3	Above 25% and Below 50%	59	24.38
4	Above 50% and Below 75%	15	6.20
5	Above 75%	2	0.83
Total		242	100.00

14. Loss of Private Structures in the Project

15. Due to the proposed project work, 570 structures, owned by 460 displaced households will be affected. Among these, 129 structures belong to 53 legal titleholders, 95 structures are owned by 83 encroachers and rest 346 structures are owned by 324 squatter households. The details of loss of structures are presented in the **Table 11**.

Table 11: Loss of Private Structures in the Project

Sl. No.	Ownership Status	No. of Structure	No. of DHs	No. of PAPs	%
1	Legal Titleholder	129	53	420	15.05
2	Encroacher	95	83	461	16.52
3	Squatter	346	324	1909	68.42
4	Other	0	0	0	0.00
Total		570	460	2790	100.00

16. The magnitude of impacts on private structures shows that out of 570 affected structures, 43 (8.9%) structures are affected up to 25%, 76 (14.1%) structures are affected up to 50%, 84 (17.2%) structures affected up to 75% and 367 (59.8%) structures are affected fully. The site condition suggests that most of the structures getting affected more than 50% will not be viable for living and need relocation. The details of magnitude of impacts on structures are summarized in the **Table 12**. Provisions are also included in the Entitlement Matrix that structures will be compensated at replacement cost fully, and partially if it is viable. Engineer from Building Department will assess the viability of structure during verification and valuation in consultation with the affected households.

Table 12: Magnitude of Impacts on Structures

Sl. No.	Scale of Impact	No. Structure	HH	%
1	Below 25%	43	41	8.9
2	Up to 50%	76	65	14.1
3	Up to 75%	84	79	17.2
4	100%	367	275	59.8
Total		570	460	100.0

17. Type of Private Structure in the Project

18. As per census survey, out of 460 households losing their structures in the project, 223 household are losing residential structures, 153 households are losing commercial structures, 13 are losing their residential-cum-commercial structures and 71 are losing other types of structures such as

cattle shed, boundary wall, toilet, etc. The details of structures and number of displaced households are given in the **Table 13**.

Table 13: Type of Private Structure affected by the Project

Sl. No.	Type of Structure	No. of Structure	DHs	%
1	Residential Structure	292	223	25.84
2	Commercial Structure	168	153	17.73
3	Resi+Commercial Structure	15	13	1.51
4	Other Private Structure	95	71	8.23
Total		570	460	100.0

19. Use of Private Structures affected by the Project

20. The structures being affected in the project are of various usages and the details are presented in the **Table14**.

Table 14: Use of Private Structure affected by the Project

S. No.	Type of Structure	No. of Structure	%	HH	%
Residential					
1	House	200	68.49	160	71.75
2	Hut	78	26.71	53	23.77
3	Other Residential	14	4.79	10	4.48
Total		292	100.00	223	100.0
Commercial					
1	Shops	109	64.88	96	62.75
2	Hotel	2	1.19	2	1.31
3	Small Eatery	8	4.76	8	5.23
4	Kiosk	43	25.60	42	27.45
5	Farm House	0	0.00	0	0.00

6	Clinic	1	0.60	0	0.00
7	Private Office	1	0.60	1	0.65
8	Other Commercial	4	2.38	4	2.61
Total		168	100.00	153	100.0
Residential cum Commercial					
1	Resi+Com	15	100.00	13	100
Total		15	100.00	13	100.0
Other Private					
1	Boundary Wall	18	18.95	18	25.35
2	Foundation	0	0.00	0	0.00
3	Cattle Shed	27	28.42	23	32.39
4	Other Temporary (Bathroom, toilet etc.)	50	52.63	30	42.25
Total		95	100.00	71	100.0
Grand Total		570		460	

21. Type of Construction of Affected Structures

22. The structures being affected in the project are of various types by construction such as temporary, semi-permanent and permanent nature. Out of 552 main structures, 274 (49.6%) structures are of temporary in nature, 222 (40.2%) structures are of semi-permanent nature and 56 (10.1%) are of permanent nature. Similarly, there are 18 affected boundary walls and all of them are semi-permanent in nature of construction. The details of type of constructions of the affected structures are summarized in the **Table15**.

Table 15: Type of Construction of Affected Structure

Sl. No.	Construction Type	No. of Structure	%
Main Structure			
1	Temporary	274	49.6
2	Semi-Permanent	222	40.2

3	Permanent	56	10.1
Total		552	100.0
Boundary Wall			
1	Semi-Permanent	18	100.0
Total		18	100.0
Grand Total		570	100.0

23. Age of the Affected Structures

24. As shown in Table 16 below out of total affected structures maximum (79.12 %) were constructed within last 5 years.

Table 16: Age of Affected Structure

Sl. No.	Age of Structure	No. of Structure	%
1	Up to 5 Years	451	79.12
2	Above 5 Years and below 10 Years	82	14.39
3	Above 10 Years and below 15 years	16	2.81
4	Above 15 Years and below 25 years	17	2.98
5	Above 25 Years and below 35 Years	3	0.53
6	Above 35 Years	1	0.18
Total		570	100.0

25. Loss of Livelihoods in the Project

26. The census survey revealed that out of total 665 displaced DPs 371 are also losing their livelihood due to loss of productive assets. It was found that 371 DPs losing livelihoods includes 189 owners of agriculture land, 153 owners of commercial structures, 13 owners of residential cum commercial structures and 16 tenants in commercial establishment doing business activity in commercial structures. The details of impact on livelihoods in the project are presented in the **Table 17**.

Table 17: Loss of Livelihoods in the Project

Sl. No.	Loss	Households	%
1	Owners of Agricultural Land	189	50.94
2	Agricultural Labourer	0	0.00

3	Agricultural Tenants/ Leaseholders	0	0.00
4	Sharecropper	0	0.00
5	Loss of Commercial Structure	153	41.24
6	Loss of Residential cum Commercial Structure	13	3.50
7	Commercial Tenants	16	4.31
8	Employees in Structures	0	0.00
Total		371	100.0

27. Loss of Community Property Resources

28. In terms of community property resources (CPR), 29 structures were reported to be affected. Out of 29 structures, 12 are religious structures (11 temples, and 1 otherlike sacred *chabutra*) and 17 government structures like school, bus stop, amenities and govt. offices. The types of affected CPRs are presented in the **Table 18**, and the list of CPR affected in the project is presented in **Appendix: 3**. CPRs will be compensated either by cash compensation at replacement cost to the community (registered trust, society or village committee as appropriate) or reconstruction of the community structure in consultation with the affected community.

29. CPR clearing and reconstruction will be undertaken by civil works contractors, and the associated costs are incorporated in their contract document.

Table 18 :Type of affected CPR

Sl. No.	Type of Structure	No. of Structure	%
1	Community Structure (Sitting Place etc.)	0	0.00
2	Religious Structure (Temple, Shrine, Mosque, etc.)	12	41.38
3	Government Structure (School and govt. offices etc.)	17	58.62
Total		29	100.0

30. Loss of Private Trees

31. During census survey 343 trees belong to private owners were also reported to be affected. These include 119 fruit-bearing and 224 non-fruit bearing trees. The details are given in **Table 19**. The estimation of loss and compensation of private trees will be done by approved valuers from Horticulture Department.

Table 19 :Type of affected Trees

Sl. No.	Type of Tree	No. of Trees	%
1	Fruit Bearing	119	34.69
2	Non-fruit Bearing	224	65.31
Total		343	100.0

32. SOCIOECONOMIC INFORMATION AND PROFILE

1. General Socio-economic Profile of DPs

2. There are 665 household (649 owners and 16 tenant households) who will be affected under the subproject. The socio-economic information and findings of 649 households collected through the census survey are presented in the following sections.

3. Number of DPs

4. There are 4563 DPs in total being affected by the project which includes 2619 (57.4%) males and 1944 (42.6%) females. The average household size is 7 and the sex ratio among the DPs is 742. The average household size is quite large because of many joint families and joint ownership. The details of DPs being affected in the project are presented in the **Table 20**.

Table 20: Number of Displaced Persons

Sl. No.	Categories of APs	No. of DPs	%
1	Male	2619	57.40
2	Female	1944	42.60
Total		4563	100.0

5. Social Categories of the DPs

6. The social stratification of the project area shows dominance of other backward caste (OBC) population with 514 (79.2%) households followed by schedule caste with 99 (15.25%) households and higher caste with 32 (4.93%). 4 households did not reveal their caste identity. The detail of social grouping in the project area is presented in the **Table 21**.

Table 21: Social Categories of the DPs

Sl. No.	Description of the Caste	No. of Households	%
1	Scheduled Caste	99	15.25
2	Scheduled Tribe	0	0.00

3	Other Backward Caste	514	79.20
4	Higher Caste	32	4.93
5	Other/No Response	4	0.62
Total		649	100.00

7. Religious Categories of the DPs

8. Majority of displaced person (90.45%) belong to Hindu religion followed by Muslim (10%). The religious categories of DPs are given below in **Table 22**.

Table 22: Religious Categories of the DPs

Sl. No.	Religious Categories	No. of Households	%
1	Hindu	587	90.45
2	Muslim	59	9.09
3	Others/No Response	3	0.46
Total		649	100.00

9. Number of DPs considered as Separate family as per LA Act

10. There are various categories of DPs as summarized in the **Table 23** are treated as separate family under Right to Fair Compensation in Land Acquisition and Resettlement Act-2013.

Table 23: Number of DPs considered as Separate family as per LA Act

Sl. No.	Categories of DPs	No. of DPs	%
1	Unmarried Son > 30 years	157	74.41
2	Unmarried Daughter/Sister > 30 years	31	14.69
3	Divorcee/Widow	23	10.90
4	Minor Orphan	0	0.00
Total		211	100.00

11. Educational Status of DPs

12. The educational status of DPs reveals that around 45.26% DPs are illiterate. Among the literate DPs, 71% are upto matric, 20.5% are graduate and only 2.4 % (68) are above graduate. This data excludes the children below 0 to 6 years. The gender segregated details of educational status of DPs are presented in the **Table 24**.

Table 24: Educational Status of DPs

S. N.	Educational status	Male	%	Female	%	Total	%
1	Illiterate	592	25.91	698	41.75	1290	45.26
2	Literate	238	10.42	188	11.24	426	14.95
3	Up to middle	499	21.84	298	17.82	797	27.96
4	Below metric	171	7.48	120	7.18	291	10.21
5	Metric	332	14.53	168	10.05	500	17.54
6	Graduate	400	17.51	185	11.06	585	20.53
7	Above graduate	53	2.32	15	0.90	68	2.39
Total		2285	100.00	1672	100.00	3957	100.0

13. Occupational Status of DPs

14. The occupational pattern of DPs excluding children below 6 years, old/inactive, students, housewife reveals that to a maximum 34% DPs are earning from labour activities, around 28% are in service, 17% are involved in agriculture activities and 14 % are in business. Among other categories, 7% DPs are active in professional services. The details of occupational status of DPs are summarized in the **Table 25**. As per ADB SPS, income will be restored, at least to the pre-project level. Additional information can be found in Chapter VII.

Table 25 : Occupational Status of DPs

S. N.	Occupational status	Male	%	Female	%	Total	%
1	Service	65	5.39	699	47.17	764	28.43
2	Business	185	15.35	196	13.23	381	14.18
3	Agriculture	152	12.61	299	20.18	451	16.78
4	Labor	794	65.89	120	8.10	914	34.02
5	Professional	9	0.75	168	11.34	177	6.59
Total		1205	100.00	1482	100	2687	100.0

15. Annual Income Level of the Affected Households

16. There are 3 (0.46%) households earning less than the official poverty level i.e. Rs. 46,680/- per year. There are 495 households (76%) having an average monthly income of above Rs. 46,680 and up to Rs. 1,00,000. The survey reveals that 101 (16%) households are earning above Rs. 1,00,000 and 37 (6%)

households are earning above Rs. 2,000,00 which is a good economic indicator of their standard of living. The average income level of households in the project area is summarized in the **Table 26**.

Table 26: Annual Income Level of the Affected Households

Sl. No.	Annual Income Categories in (Rs)	No. of Households	%
1	Upto 46,680	3	0.46
2	Above 46,680 and up to 100,000	495	76.27
2	Above 100,000- Below 200,000	101	15.56
4	Above 200,000	37	5.70
5	Not Responded/ Found	13	2.00
Total		649	100.00

17. Vulnerable Households being Affected in the Project

18. According to project census survey there are 553 households enumerated as vulnerable households. In this project vulnerable group includes 99 SC households, 13 women headed households, 3 households headed by physically handicapped persons, 383 other poor households who are living below the government poverty line and the 54 non-titleholders (squatters only) not falling under any other category of vulnerability. As per the latest Planning Commission, Government of India estimate, any person having monthly per capita consumption and expenditure (MPCE) of Rs. 7789 in rural area and Rs. 923 in urban area of Bihar is considered to be living below poverty line. Based on this calculation of poverty line figure, average annual household MPCE in rural Bihar is Rs. 46,680. There is one household not falling under any other category but earning less than the average MPCE also enumerated as vulnerable household in the project. The vulnerable household details are presented in the **Table 27**.

Table 27: Vulnerable Households being affected

Sl. No.	Vulnerable Categories	Households	%
1	Scheduled Caste households	99	17.90
2	Scheduled Tribe Households	0	0.00
3	Women Headed Households	13	2.35
4	PH Headed Households	3	0.54

9 Source: Press Note on Poverty Estimates, 2011-12, Government of India, Planning Commission, July 2013

5	BPL Cardholders (not falling in other categories)	383	69.26
6	Households below Minimum Per capita Income (not falling under any other category of Vulnerability)	1	0.18
7	NTH not falling under any above Categories	54	9.76
Total		553	100.00

19. Project Impact on Indigenous People

20. As per the 2011 census of India survey, total ST population of Bihar is about 1.28% of total and it is 0.04% in Khagaria district and 0.3% in Saharsa district. In this subproject, not a single tribal household is found affected. Any impact on ST household will be reported during RP implementation and they will be treated as vulnerable. Special provision has been made in the entitlement matrix of RP to deal with any impacts on tribal households.

21. Project Impact on Women

22. Improved roads will bring equal benefits to women and girls. Direct benefits include a decrease in travel time and an increase in reliable and convenient transport services. Indirect benefits include improved access to products and services, including social services such as health, education, as well as other government services. During construction, women will also benefit from the increased employment opportunities. However, road construction and improvements may also lead to potential negative impacts such as the spread of STIs (sexually transmitted infections), trafficking, and road safety issues. Potential negative impacts will be addressed through community awareness that will be implemented by the RP implementing agency who will assist the EA (see **Appendix 5** for TOR of Implementing agency). The RP implementing agency will coordinate with relevant organizations or mobilize its own short-term experts in carrying out the activities. In addition, the contractor will also carry out HIV/AIDS awareness program among worker camps and nearby community as mandated in their contract.

1. Status of Women in Subproject Area

23. Out of 665 project affected households surveyed for socio-economic study 614 were found with total 1304 women above 18 years of age. Women in all 614 households were consulted separately through structured questionnaire and an analysis of the same is given in the following section.

2. Decision Making

24. Women were asked about their role in decision making on financial and social matters of the household. It was revealed that in around 72% household women responded negatively that they have no role in financial decision and the decision is taken by her male counterpart. Similarly, in case of social decision the male members of the households are dominant. The details are given in following **Table 28**.

Table 28 : Role of Women in Financial Decision Making

S.N.	Response	Financial Decision Making (HH)	%	Social Decision Making (HH)	%
1	Yes	173	28.18	195	31.76
2	No	440	71.66	418	68.08
3	No Response	1	0.16	1	0.16
Total		614	100.00	614	100.00

3. Assets owned by the Women

25. Out of total households surveyed around 18% have women with land in their name, 14% have house, women in around 3% households have two-wheeler and around 73% have cell phone. Only around 1% have personal computer and around 0.5% have four-wheeler. The details of assets possessed by the women in project area is given below.

Table 29 : Number of Households having Women with different Assets

Sl.	Type of Assets	No of Household	%
1	Land (Homestead or Farm Land)	110	17.92
2	House	85	13.84
3	Four-Wheeler (Car/tractor etc.)	3	0.49
4	Two-Wheeler (Scoter/ Cycle etc.)	16	2.61
5	Cell Phone	449	73.13
6	Personal Computer	5	0.81
7	Other assets	15	2.44
Total		614	100.00

4. Bank Account

26. The women were asked about their separate bank account at the household level and it was found that about 95% households have women with their separate bank account. This is largely due to the government policies of empowering poor and girl child for financial securities in particular. The details are provided in the **Table30**.

Table 30 : Number of Households having Women with Bank Account

Sl.	Bank Account	No of Household	%
1	Yes	583	94.95
2	No	31	5.05
3	No Response	0	0.00
Total		614	100.00

5. Member in Self Help Group

27. The women in affected households were asked about their participation in any self-help group as a member. As shown in **Table 31** it was revealed that women in around 47% households were found member of a self-help group and only around 12 % of them had apprehension that relocation due to construction of sub project might affect their working in the SHG.

Table 31 : Number of Households having Women as Member of SHG

S	Response	Member of SHG (HH)	%	Change in Status after Relocation (HH)	%
1	Yes	287	46.74	33	11.50
2	No	327	53.26	254	88.50
3	No Response	0	0.00	0	0.00
Total		614	100.00	287	100.00

28. Women in project area have received benefits under different government schemes. It was revealed that women in around 35% affected households have taken loan for different purposes. Women in around 21% households have benefited under gov't's house construction scheme. Among others, women in around 21% households have taken training and assistance for self-employment. In total, women in 47% households have benefited under different government scheme. The details are provided in table below.

Table 32 : Women benefited from Govt. Schemes

Sl.	Type of Benefits	No of Household	%
1	Loan	100	34.84
2	House	61	21.25
3	Employment	1	0.35
4	Training	60	20.91
5	Any Other	89	31.01
Total		287	100.00

29. As per the findings of consultation with women group, the perceived benefits from the subprojects includes:

1. Improved access to social facilities like health, education
2. Increase in income generating activities
3. Frequent and affordable transport
4. Management of emergency situation
5. Improved community relations
6. Increased frequency of health workers, extension workers visits
7. Improved access to market
8. Increased Leisure time
9. Reduced time spent on transportation of forest produces
10. Side pavements will make walking easy

11. During the consultation process the negative impacts could not be easily articulated by the women apart from loss of assets. However, along with the loss of assets the following negative impacts were also recorded:

1. Loss of assets as a result of the road construction
2. Preference to men as wage labor over women during construction
3. Discrimination in wage payment
4. More dependence of mechanized techniques in road construction likely to have very little opportunity for labor for women

5. There are 13 women headed households affected in the project. The negative impacts of the sub-project on female-headed households will be taken up on a case-to-case basis and assistance to these households will be treated on a priority basis. During disbursement of compensation and provision

of assistance, priority will be given to female-headed households. Additionally, women headed households are considered as vulnerable and provision for additional assistance has been made in the entitlement of the RP. Provision for equal wage and health safety facilities during the construction by the contractor will be ensured by the EA.

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4. STAKEHOLDERS CONSULTATION AND PARTICIPATION

1. Stakeholders in the Project

2. Consultations with various stakeholders were carried out during various phases of project preparation. The stakeholders in the project are both primary and secondary. The primary stakeholders are project displaced persons (DPs), project beneficiaries, Executing Agency, Implementing Agency especially the officials in BSRDC. The secondary stakeholder includes district magistrates and the revenue official, village heads, head of Gram Panchayat, village administrative officers, village council, district council, NGO and business communities in the area.

3. Public Consultation in the Project

4. Public consultations were arranged at the stage of project preparation to ensure peoples' participation in the planning phase of this project and to treat public consultation and participation as a continuous two-way process beneficial in projecting planning and implementation. Aiming at promotion of public understanding and fruitful solutions of developmental problems such as local needs and problem and prospects of resettlement, various sections of DPs and other stakeholders were consulted through focus group discussions and individual interviews.

5. Methods of Public Consultation

6. Consultations and discussions were held along the project with the affected families and other stakeholders. All displaced households were consulted while interacting with them during the project census survey. Consultation meetings were organized to get wider public input from both the primary and secondary stakeholders. The consultation methods followed to elicit required information (their views & opinions) are detailed below in **Table 33**.

Table 33: Methods of Public Consultations

Stakeholders	Consultation Method
Displaced Persons	Through Census Survey involving head of the household as respondent
Village Head/representative of APs	Through Focus Group Discussions (FGD) at affected villages
Local communities	Through Focus Group Discussions (FGD) at affected villages
Women's groups	Through Census survey and Focus Group Discussions (FGD) at affected villages
Vulnerable groups (SC, ST, BPL)	Through Focus Group Discussions (FGD) at affected villages
Executing Agency, Implementing Agency	Individual interview, discussion, joint field visit
Line Departments/Agencies	Individual meeting/interview, discussion

7. Scope of Consultation and Issues

8. All the survey and consultation meetings were organised with free and prior information to the displaced persons and participants. Women members of the survey team assisted women to present their views on their particular concerns. During the consultation process efforts were made by the survey teams to:

1. Ascertain the views of the DPs, with reference to road alignment and minimization of impacts;
2. Understand views of the community on land acquisition, resettlement issues and rehabilitation options;
3. Identify and assess the major socio-economic characteristics of the villages to enable effective planning and implementation;
4. Obtain opinion of the community on issues related to the impacts on community property and relocation of the same;
5. Examine APs' opinion on problems and prospects of road related issues;
6. Identify people's expectations from project and their absorbing capacity;
7. Finally, to establish an understanding for identification of overall developmental goals and benefits of the project.

8. Findings of Focused Group Discussions

9. During the resettlement survey, FGDs were conducted in affected villages along the project road. The participants in these FGDs are not limited to the place of meeting or DPs only but also included the other interested parties from the affected villages as all of them road users and beneficiaries under the Project. Further detailed analysis is included in the report of Poverty and Social Assessment (PSA).

10. In addition to the individual consultation with all displaced households during census survey, a total of 77 male and 98 females were consulted separately in 5 consultation meetings/focused group discussions. Some of the major issues that were discussed and feedback received from the villagers during the course of the consultations and measures taken are summarized in the **Table 34**. A detail of consultation is provided in **Appendix-4** and the list of participants and consultation photographs are presented in the **Appendix-5**. Summary of DP's concerns and preferences toward relocation and resettlement were discussed and are recorded in Chapter VII: Relocation of Housing and Settlements.

Table 34: Summary findings of Consultation

Issue	Discussion/Suggestion	Measures Taken
Existing Road Condition	Existing road condition is bad and not sufficient to bear current traffic load. Road is narrow and accident prone due to heavy traffic and high speed of vehicles	The proposed road will have 2 lane specifications, provide all weather connectivity to people living in village along the corridor.
Transport and communication	Existing road is narrow and congested and traffic jam is very common in this	The project road will provide better connectivity and a faster transportation to

Issue	Discussion/Suggestion	Measures Taken
problem	area.	distance places
Positive project impact	The positive project impacts perceived by the local people are all weather road, direct access to many facilities, transportation of their agricultural produce, business and employment opportunities, appreciation of land value etc.	The alignment and widening is planned to provide maximum connectivity to the area and benefits to the local people
Negative project impacts	Loss of residential/commercial structures, loss of livelihood, increase of accidents, pollution.	All loss of structure will be compensated at replacement cost. Loss of livelihoods will also be compensated and assisted by the project including opportunity for laborer in construction work
Rate of compensation	Compensation at replacement cost.	The rate of compensation will be decided as per market value and replacement cost will be given
Option for relocation	Willingness for self-relocation and cash compensation. Majority of the DPs want cash compensation.	The affected people will be given cash compensation for loss of their assets. The RP implementing agency will assist the DPs during the process.
Income Restoration	Additional assistance for income restoration	The implementation agency will assist in loan from bank, preference will be given to locals in road construction work
Consultation and participation	People want more consultation during project implementation and want to participate in the project	Public consultation will continue throughout the project cycle. Implementing agency will assist people in participation at various stages.
Road safety	The proposed two-lane road may be concern for safety specifically for women and children, accident risk will increase	Proper road safety measures are incorporated in the project design. Special measures like signage, speed breakers at schools, hospitals and market places will provided by the project.
Transparency in	The project should ensure transparency	There are provisions like GRC, VLC and

Issue	Discussion/Suggestion	Measures Taken
Project Implementation	in implementation and quality control	direct access to Implementation Office for any complain or grievances
Any other critical issue	Speed breaker, road crossing point drainage and bus stand should be given in habitation areas.	The features are already included in the road design at appropriate locations.

11. Consultation with Officials and Other Stakeholders

12. Other stakeholders in the project such as Executing Agency especially the officials in BSRDCL, PIU staff and the concerned district administration and the revenue officials were also consulted on various issues. The details of some of such consultations are summarized in the **Table 35**.

Table 35: Details of Consultation with Officials

Sl. N.	Name and Designation	Issue discussed	Contact information
1	Mr. Qamar Alam CGM, BSRDCL	Overall Project planning, Coordination,	9431005710
2	Mr. P.C. Gupta GM, BSRDCL	Project proposal, alignment, detailed design report, LA and R&I issue,	9431005702
3	Mr. Arwind Kumar, DGM (LA) -BSRDCL	DPR, Land acquisition planning, collection of revenue map.	9431005716
4	Mithilesh Kumar, LA Expert, BSRDCL-HQ	LAP, IRP and revenue details of affected properties.	8340644841
5	Mr. Anjani Kumar, D.G.M BSRDCL-PIU-Khagaria	Land acquisition planning, collection of revenue map and landholder's details, site visit, coordination with line department	9431005694
6	Mr. Kumar Dhiraj, Manager (Tech), BSRDCL-PIU-Khagaria	Drawing, map, data and site verification.	9431005729
7	Mr. Bnarat Bhushan, Circle Officer (C.O), Mansi, Chautham	Site visit, siet verification, corrdination with line departments etc.	9113410073
8	Mr. Gopal Krishan Mishra.		9430003544

Sl. N.	Name and Designation	Issue discussed	Contact Information
	C.I, Mansi		
9	Mr. Dilip Dev Tiwari, C.I., Chautham		9934981620
10	Mr. Nalin, Revenue Clerk, Chautham		8862938637

13. Plan for further Consultation in the Project

14. The effectiveness of the R&R program is directly related to the degree of continuing involvement of those affected by the Project. Several additional rounds of consultations with DPs will form part of the further stages of project preparation and implementation. The RP implementing agency will be entrusted with the task of conducting these consultations during RP implementation, which will involve disclosure on compensation, assistance options, and entitlement package and income restoration measures suggested for the project. The consultation will continue throughout the project implementation period. The following set of activities will be undertaken for effective implementation of the RP:

1. In case of any change in engineering alignment planning the DPs and other stakeholders will be consulted in selection of road alignment for minimization of resettlement impacts, development of mitigation measures etc.
2. Together with the RP implementing agency, the PIU will conduct information dissemination sessions in the project area and solicit the help of the local community/ leaders and encourage the participation of the DP's in Plan implementation.
3. During the implementation of RP, RP implementing agency will organize public meetings, and will appraise the communities about the progress in the implementation of project works, including awareness regarding road construction.
4. Consultation and focus group discussions will be conducted with the vulnerable groups like women, SC, ST, and OBC's to ensure that the vulnerable groups understand the process and their needs are specifically taken into consideration.
5. To make reasonable representation of women in the project planning and implementation they will be specifically involved in consultation.

6. A Public Consultation and Disclosure Plan will be prepared by PIU and RP implementing agency for the project as per the format below in **Table 36**.

Table 36 : Future Public Consultation and Disclosure Plan

Activity	Task	Timing (Date/Period)	Agencies	Remarks
Public Notification	Notify eligibility cut-off date for NTH	March 2021	PIU/ RP implementing agency	
Disclosure of RP	Translate RP in Hindi and disclose at PIU Office and Panchayat	March 2021	PIU / RP implementing agency	
Distribution of R&R information leaflet	Prepare R&R information leaflet and distribute to DPs	May 2021	PIU/ RP implementing agency	
Internet disclosure of the RP	Post RP on ADB and EA website	May 2021	ADB/ RP implementing agency/PIU	
Consultative meetings during joint measurement survey	Face to face meetings with DPs	June 2021	PIU / RP implementing agency	
Disclosure of updated RP	Disclosure after joint measurement survey	July 2021	PIU / RP implementing agency	
Disclosure of the final or updated RP	RP disclosed on ADB and EA website and to affected households and other stakeholders at PIU and/or Panchayat offices	August 2021	ADB/PIU	

7. Information Disclosure

8. To keep more transparency in planning and for further active involvement of DPs and other stakeholders the project information will be disseminated through disclosure of resettlement planning documents. The EA will submit the following documents to ADB for disclosure on ADB's website:

1. the final resettlement plan endorsed by the EA after the census of displaced persons has been completed;
2. a new resettlement plan or an updated resettlement plan, and a corrective action plan prepared during project implementation, if required; and
3. the resettlement monitoring reports.

4. The EA will translate the RP in Hindi and disclose it at PIU office and panchayat office. A resettlement information leaflet containing information on compensation, entitlement and resettlement management adopted for the project will be made available in Hindi language and distributed to DPs by the RP implementing agency during initial consultation after verification of DPs. For DPs who are illiterate, appropriate and implementable method will be followed in order for the DPs to be notified and informed. RP implementing agency will disseminate relevant information through public consultations and other channels and will pay specific attention to ensure those who are illiterate receive information on a timely basis.

5. LEGAL FRAMEWORK

1. Introduction

2. The legal framework and principles adopted for addressing resettlement issues in the project have been guided by the existing legislation and policies of the Government of India (GOI), the Government of Bihar and Asian Development Bank. Prior to the preparation of the RP, a detailed analysis of the existing national and state policies was undertaken and the section below provides details of the various national and state level legislations studied and their applicability for the project. This RP is prepared based on the review and analysis of all applicable legal and policy frameworks of the country and ADB policy requirements.

3. Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCT in LARR), 2013

4. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCT in LARR Act - 2013) has been effective from January 1, 2014 after receiving the assent of the President of Republic of India. This Act extends to the whole of India except the state of Jammu and Kashmir. The Act replaced the Land Acquisition Act, 1894.

5. The aims and objectives of the Act include: (i) to ensure, in consultation with institutions of local self-government and Gram Sabhas established under the constitution of India, a humane, participative, informed and transparent process for land acquisition for industrialization, development of essential infrastructural facilities and urbanization with the least disturbance to the owners of the land and other affected families; (ii) provide just and fair compensation to the affected families whose land has been acquired or proposed to be acquired or are affected by such acquisition; (iii) make adequate provisions for such affected persons for their rehabilitation and resettlement; (iv) ensure that the cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post-acquisition social and economic status and for matters connected therewith or incidental thereto.

6. Section 27 of the Act defines the method by which market value of the land shall be computed under the proposed law. Schedule I outlines the proposed minimum compensation based on a multiple of market value. Schedule II through VI outline the resettlement and rehabilitation entitlements to land owners and livelihood losers, which shall be in addition to the minimum compensation per Schedule I.

7. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Amendment) Second Ordinance, 2015: With an intention to overcome the procedural difficulties in land acquisition for important national projects, President of India has issued an amendment ordinance on 30th May 2015. Three main features of the ordinance among others are as following:

1. The Chapter II and III of the RFCT in LARR Act - 2013 regarding *determination of social impact assessment and public purpose and special provision to safeguard food security* shall not apply to the project such as (a) vital to national security or defence of India and every part thereof, including preparation for defence or defence production; (b) rural infrastructure including electrification; (c) affordable housing and housing for the poor people; (d) industrial

corridors ; and (e) infrastructure and social infrastructure projects including projects under public private partnership where the ownership of land continues to vest with the Government.

2. The five-year period set by the principal Act in Section 24 under sub-section (2), for lapse of 1894 Act shall exclude the cases where acquisition process is held up on account of any stay or injunction issued by any court or the period specified in the award of a Tribunal for taking possession.

3. The five-year period set by the principal Act for any land acquired and unused is now will be *a period specified for the setting up of any project or five years, whichever is later.*

4. Legal and Policy Frameworks of Bihar State

5. The legislations and policy concerning the land acquisition and resettlement by State Government of Bihar are discussed in the following section.

1. Bihar Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2014 (Government of Bihar Department of Revenue and Land Reforms Notification No-1401, Dated-27/10/2014)

2. In exercise of the powers conferred by sub-section (2) of Section 109 of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (30 of 2013), the Governor of the State of Bihar notified the rules to apply for land acquisition in the state where the State Government will be the requiring body as defined by the prime Act.

3. Appointment of Social Impact Assessment Unit by Government of Bihar (Government of Bihar Department of Revenue and Land Reforms Notification No-647, Dated-09/05/2014)

4. The Government of Bihar has authorized Lalit Narayan Mishra Institute of Economic Development & Social Change, Patna and A N Sinha Institute of Social Studies, Patna as Social Impact Assessment Unit under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

5. Bihar Raiyati Land Lease Policy 2014 (No. 14/D.L.A (Lease) – Policy –69/2014 – 1440/R) with Amendment Rules April-2018.

6. In exercise of the powers conferred under section 104 of The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, the State Government of Bihar has announced its state policy for taking land on perpetual lease from the raiyats for the works of public purposes as an option for public projects of infrastructure and public purposes. The subsequent amendment of this policy in April 2018 specifies the limit of purchase of land under this policy by Road Construction Department is up to 25 Acres and empowers the Executive Engineers to register the land in their name.

7. ADB's Safeguard Policy Statement (SPS), 2009

8. The objectives of ADB's SPS (2009) with regard to involuntary resettlement are: (i) to avoid involuntary resettlement wherever possible; (ii) to minimize involuntary resettlement by exploring project and design alternatives; (iii) to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and (iv) to improve the standards of living of the displaced poor and other vulnerable¹⁰ groups.

9. ADB's SPS (2009) covers physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of; (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers displaced persons whether such losses and involuntary restrictions are full or partial, permanent or temporary.

10. The three important elements of ADB's SPS (2009) are: (i) compensation at replacement cost for lost assets, livelihood, and income prior to displacement; (ii) assistance for relocation including provision of relocation sites with appropriate facilities and services; and (iii) assistance for rehabilitation to enhance, or at least restore, the livelihoods of all displaced persons relative to national minimum standard of living.

11. Comparison of Government and ADB Policies

12. The new act 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013', which has integrated provisions of National Rehabilitation and Resettlement Policy (2007) with that of The Land Acquisition Act (LAA) of 1894 (as amended in 1984), recognizes titleholders and non-titleholders affected by land acquisition area notified under the Act. Whereby, squatters and encroachers on existing government land are excluded from the purview of the act.

13. RFCT in LARR Act – 2013 has come into effect from January 1, 2014. This Act is both complement the revision of the NRRP (2007) and decrease significantly the gaps between the LAA and ADB's SPS, 2009. The Act also expands compensation coverage of the principal act by requiring that the value of trees, plants, or standing crops damaged must also be included and solatium being 100% of the all amounts inclusive. The Act furthermore has match ADB requirements for all compensation to be paid prior to project taking possession of any land.

14. Therefore, the RFCT in LARR Act – 2013 has established near equivalence of the government's policies with those of ADB's SPS, 2009. Adoption of the below principles for the project has ensured that both are covered in their application to this project. A comparison of ADB and GoI policy and measures to fill the gaps is presented in the Table: 37.

¹⁰ vulnerable groups include: especially those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land

Table 37: Comparison of ADB and GoI Policy

	Aspect	ADB Safeguard Requirement	Fair Compensation and Transference in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Measures to Bridge the GAP
1	Screen the project	Screen the project to identify past, present, and future involuntary resettlement impacts and risks. Conduct survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement	4 (l) it is obligatory for the appropriate Government intends to acquire land for a public purpose to carry out a Social Impact Assessment study in consultation with concern Panchayat, Municipality or Municipal Corporation, as the case may be, at village level or ward level in the affected area. The Social Impact Assessment study report shall be made available to the public in the manner prescribed under section 6.	Screening of all sub-projects in line with the IR checklist of ADB, towards enabling identification of the potential resettlement impacts and associated risks.
2	Consultation with stake holders and establish grievance redress mechanism	Carryout consultations with displaced persons, host communities and concerned NGOs. Inform all displaced persons of their entitlements and resettlement options	Whenever a Social Impact Assessment is required to be prepared under section 4, the appropriate Government shall ensure that a public hearing is held at the affected area, after giving adequate publicity about the date, time and venue for the public hearing, to ascertain the views of the affected families to be recorded and included in the Social Impact Assessment Report. The Land Acquisition Rehabilitation and Resettlement Authority shall be established in each State by the concerned State Government to hear disputes arising out of projects where land acquisition has been initiated by the State Government or its agencies.	No gap between SPS and FCTLARR.
3.	Improve, or at least restore, the livelihoods of all displaced, and payment at replacement cost	Improve or restore the livelihoods of all displaced persons through: (i) land-based resettlement strategies; (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt	The Collector having determined the market value of the land to be acquired shall calculate the total amount of compensation to be paid to the land owner (whose land has been acquired) by including all assets attached to the land. Livelihood losers are eligible for various rehabilitation grants.	No gap between SPS and FCTLARR. Assets to be compensated at replacement cost without depreciation and other Livelihood assistances and income restoration measures will be included.

	Aspect	ADB Safeguard Requirement	Fair Compensation and Transference in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Measures to Bridge the GAP
		compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.		
4.	Assistance for displaced persons	Provide physically and economically displaced persons with needed assistance	Schedule I, provides market value of the land and value of the assets attached to land. Schedule II provides R&R package for land owners and for livelihood losers including landless and special provisions for Scheduled Tribes.	No gap between SPS and FCTLARR. Entitlement Matrix outlines compensation and assistance for DPs.
5.	Improve standard of living of displaced vulnerable groups	Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards	FCTLARR only provide special provisions scheduled tribe.	Provisions outlined in ADB SPS will be followed for the project
6.	Negotiated Settlement	Develop procedures in a transparent, consistent, and equitable manner. If land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status	FCTLARR only apply in case of land acquired/purchased for PPP projects and for Private Companies. Section: 2. (2), and 46.	Provisions outlined in ADB SPS will be followed for the project.
7.	Compensation For non-title holders	Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of	Non-titleholders on acquired land area is only included but not clear about non-titleholders in existing govt. land	Provisions outlined in ADB SPS will be followed for the project.

	Aspect	ADB Safeguard Requirement	Fair Compensation and Transference in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Measures to Bridge the GAP
		non-land assets.		
8.	Requirement of RP	Prepare a resettlement plan / indigenous peoples plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.	Preparation of Rehabilitation and Resettlement Scheme including time line for implementation. <i>Section: 16. (1) and (2).</i> Separate development plans to be prepared. <i>Section 41</i>	No gap between SPS and FCTLARR. RP will be prepared for project with impact.
9.	Public disclosure	Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to displaced persons and other stakeholders. Disclose the final resettlement plan and its updates to displaced persons and other stakeholders	Under clause 18, the Commissioner shall cause the approved Rehabilitation and Resettlement Scheme to be made available in the local language to the <i>Panchayat</i> , Municipality or Municipal Corporation. As the case may be, and the offices of the District Collector, the Sub-Divisional Magistrate and the <i>Tahsil</i> , and shall be published in the affected areas, in such manner as may be prescribed and uploaded on the website of the appropriate Government.	In addition to the publishing of the approved resettlement plan, the RF includes provision for disclosure of the various documents pertaining to RP implementation.
10.	Cost of resettlement	Include the full costs of measures proposed in the resettlement plan and indigenous peoples plan as part of project's costs and benefits. For a project with significant involuntary resettlement impacts and / or indigenous peoples plan, consider implementing the involuntary resettlement component of the project as a stand-alone operation.	16. (I) Upon the publication of the preliminary notification under sub-section (/) of section 11 by the Collector, the Administrator for Rehabilitation and Resettlement shall conduct a survey and undertake a census of the affected families, in such manner and within such time as may be Prescribed, which shall include: (a) particulars of lands and immovable properties being acquired of each affected family; (b) livelihoods lost in respect of land losers and landless whose livelihoods are primarily dependent on the lands being acquired; (c) a list of public utilities and Government buildings which are affected or	No gap between SPS and FCTLARR. Cost of resettlement will be covered by the EA.

	Aspect	ADB Safeguard Requirement	Fair Compensation and Transference in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Measures to Bridge the GAP
			likely to be affected, where resettlement of affected families is involved; (d) details of the amenities and infrastructural facilities which are affected or likely to be affected, where resettlement of affected families is involved; and (e) details of any common property resources being acquired'	
11.	Taking over possession before Payment of compensation	Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation.	38 (l) The Collector shall take possession of land after ensuring that full payment of compensation as well as rehabilitation and resettlement entitlements are paid or tendered to the entitled persons within a period of three months for the compensation and a period of six months for the monetary part of rehabilitation and resettlement entitlements listed in the Second Schedule commencing from the date of the award made under section 30.	No gap between SPS and FCTLARR.
12.	Monitoring	Monitor and assess resettlement outcomes, their impacts on the standards of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Disclose monitoring reports.	48 (l)The Central Government may, whenever necessary for national or inter-State projects, constitute a National Monitoring Committee for reviewing and monitoring the implementation of rehabilitation and resettlement schemes or plans under this Act.	For project, monitoring mechanism and frequency will follow ADB SPS based on categorization.

15. R&R Policy Framework for the Project

16. Based on the above analysis of government provisions and ADB policy, the following resettlement principles are adopted for this Project:

1. Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks. Measures to avoid and minimize involuntary resettlement impacts include the following: (i) explore alternative alignments or locations which are less impacting, (ii) ensure the appropriate technology is used to reduce land requirements, (iii) modify the designs, cross sections, and geometrics of

components to minimize the ROW and ensure involuntary resettlement is avoided or minimized.

2. Carry out meaningful consultations with displaced persons, host communities, and concerned nongovernment organizations. Inform all displaced persons of their entitlements and resettlement options. Ensure their participation in planning, implementation, and monitoring and evaluation of resettlement programs. Pay particular attention to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, and indigenous peoples, and those without legal title to land, and ensure their participation in consultations. Establish a grievance redress mechanism to receive and facilitate resolution of the concerns of displaced persons. Support the social and cultural institutions of displaced persons and their host population. Where involuntary resettlement impacts and risks are highly complex and sensitive, compensation and resettlement decisions should be preceded by a social preparation phase.
3. Improve, or at least restore, the livelihoods of all displaced persons through, (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement cost for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.
4. Provide physically and economically displaced persons with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
5. Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
6. Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for all compensation, relocation and rehabilitation measures, except land.
7. Prepare a resettlement plan elaborating on the entitlements of displaced persons, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule. This resettlement plan will be approved by ADB prior to contract award.
8. Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to displaced persons and other stakeholders. Disclose the final resettlement plan and its updates to displaced persons and other stakeholders.
9. Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone

- operation.
10. Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation.
 11. Monitor and assess resettlement outcomes, their impacts on the standard of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Disclose monitoring reports.
 12. Valuation of Assets
 13. The valuation of affected land and structures will be governed by the following process:

14. Land surveys for determining the payment of compensation would be conducted on the basis of updated official records and ground facts. The land records containing information like legal title, and classification of land will be updated expeditiously for ensuring adequate cost compensation and allotment of land to the entitled displaced persons. Records as they are on the cut-off date will be taken into consideration while determining the current use of land. The economically unviable residual land remaining after the land acquisition will be acquired as per the provisions of RFCT in LARR Act, 2013. The owner of such land/property if desired so, will have the right to seek acquisition of his entire contiguous holding/ property provided the residual land if is economically unviable. However, the Collector will decide on the viability and acquisition of such land under section 94 (1-4) of RFCT LARR Act, 2013 and his decision will be termed as final.

15. The methodology for verifying the replacement cost for each type of loss will be calculated as per the provision made in the RFCT in LARR Act -2013, which take account of market value, additional solatium, transitional value and therefore, equivalent to the replacement cost defined in the SPS 2009.

1. Valuation of Land:

2. The District Collector/Deputy Commissioner shall determine the market value of the land with assessment of (a) the market value, if any, specified in the Indian Stamp Act, 1899 for the registration of sale deeds or agreements to sell, as the case may be, in the area, where the land is situated; or (b) the average sale price for similar type of land situated in the nearest village or nearest vicinity area; or (c) consented amount of compensation as agreed upon, whichever is higher.

3. Where the market value as per above section (1) cannot be determined for the reason that: (a) the land is situated in such area where the transactions in land are restricted by or under any other law for the time being in force in that area; or (b) the registered sale deeds or agreements to sell for similar land are not available for the immediately preceding three years; or (c) the market value has not been specified under the Indian Stamp Act, 1899; the appropriate authority, the State Government concerned shall specify the floor price or minimum price per unit area of the said land based on the Price calculated in the manner specified in the above section (1) in respect of similar types of land situated in the immediate adjoining areas.

4. The market value calculated as per above section (1) shall be multiplied by a factor of (a) 1 (one) to 2 (two) in rural areas based on the distance of project from Urban Area as notified by the State Government; and (b) one in urban areas.

5. Solatium amount equivalent to 100% of the market value calculated on the basis of above (1 or 2) x 3.

Hence;

The cost of land in rural areas = $X + 100\%$ of X ,

The cost of land in urban areas = $X + 100\%$ of X

Where X = Market Value as determined above x 1 to 2.

6. Valuation of Building and Structure:

7. The cost of buildings will be estimated based on updated Basic Schedule of Rates (BSR) as on date without depreciation. Since, all the affected structures belong to non-titleholders, no Solatium will be added to the estimated market value of the structure as it is provided to only the titleholders under the provision of RFCT in LARR Act -2013. During valuation of structure/building following parameters should be taken in to account:

1. From where they use to buy materials
2. Type of shops
3. Distance to be traveled
4. Sources (local or foreign) and the cost of various materials
5. Who will build the structures (owner or contractor) and whether they will use the hired labor or their own labor,
6. Obtaining cost estimates by meeting at least three contractors/suppliers in order to identify cost of materials and labor
7. Identifying the cost of different types of houses of different categories and compare the same with district level prices.
8. Calculation of the labor cost even if the structure is constructed by the household only without hiring any labor.

9. Even after payment of compensation, DPs would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. In case of any structures not removed by the DPs in stipulated 60 days period, a notice to that effect will be issued intimating that DPs can take away the materials so salvaged within 48 hours of their demolition; otherwise, the same will be disposed by the project authority without giving any further notice.

10. Valuation of Trees:

11. Compensation for trees will be based on their full replacement cost. The District Collector/Deputy Commissioner for the purpose of determining the market value of trees and plants attached to the land acquired, use the services of experienced persons/agencies in the field of agriculture, forestry, horticulture, sericulture, or any other field, as may be considered necessary by him.

12. Trees standing on the land owned by the government will be disposed off through open auction by the concerned Revenue Department/ Forest Department. DPs will be provided with an advance notice of three months prior to relocation. Further, all compensation and assistance will be paid to DPs at least 60 days prior to displacement or dispossession of assets.

13. For temporary impact on land and common resources, any land required by the project on a temporary basis will be compensated in consultation with landowners and will be restored to previous or better quality. Implementation issues can be found in the Entitlement Matrix.

6. ENTITLEMENTS, ASSISTANCE AND BENEFITS

1. Introduction

2. The project will have three types of displaced persons i.e., (i) persons with formal legal rights to land lost in its entirety or in part; (ii) persons who lost the land they occupy in its entirety or in part who have no formal legal rights to such land, but who have claims to such lands that are recognized or recognizable under national laws; and (iii) persons who lost the land they occupy in its entirety or in part who have neither formal legal rights nor recognized or recognizable claims to such land. The involuntary resettlement requirements apply to all three types of displaced persons. The project involves land acquisition and therefore legal titleholders will be affected, the RP describes provision for all type of DPs and formulated the entitlement matrix.

3. Cut-off-Date for Entitlement

4. For titleholders in case of land acquisition, the date of publication of preliminary notification for acquisition under section 11 of the PACT in LARR Act – 2013 will be treated as the cut-off date. For non-titleholders, the cut-off date will be the start date of the census survey which is 17 November 2021. The cut-off date for non-titleholders will be officially declared by the EA/IA along with the disclosure of RP. DPs who settle in the affected areas after the cut-off date will not be eligible for compensation. They, however, will be given sufficient advance notice, requested to vacate premises and dismantle affected structures prior to project implementation. Their dismantled structures materials will not be confiscated and they will not pay any fine or suffer any sanction.

5. Project Entitlement

6. In accordance with the R&R measures outlined in the previous chapter, all displaced households and persons will be entitled to a combination of compensation packages and resettlement assistance depending on the nature of ownership rights on lost assets and scope of the impacts including socio-economic vulnerability of the displaced persons and measures to support livelihood restoration if

livelihood impacts are envisaged. The displaced persons will be entitled to the following five types of compensation and assistance packages:

1. Compensation for structures (residential/ commercial) and other immovable assets at their replacement cost;
2. Compensation for the loss of land, crops/ trees at their replacement cost;
3. Assistance in lieu of the loss of business/ wage income and income restoration assistance;
4. Assistance for shifting and provision for the relocation site (if required), and
5. Rebuilding and/ or restoration of community resources/facilities.

6. **Loss of land** will be compensated at replacement cost plus refund of transaction cost (land registration cost, stamp duties etc) incurred for purchase of replacement land within the time frame mentioned in the entitlement matrix. DPs with traditional title/occupancy rights will also be eligible for full compensation for land at replacement value. If the residual plot(s) becomes not viable three options are to be given to the DP, subject to his acceptance which are (i) The DP remains on the plot, and the compensation and assistance paid to the tune of required amount of land to be acquired, (ii) Compensation and assistance are to be provided for the entire plot including residual part, if the owner of such land wishes that his residual plot should also be acquired by the IA, the IA will acquire the residual plot and pay the compensation for it. The viability of such plot would be certified by concerned subdivisional magistrate (SDM) and concerned building department of the PWD. (iii) If the DP is from vulnerable group, compensation for the entire land by means of land for land will be provided if DP wishes so, provided that land of equal productive value is available. The replacement of land option will be considered by the District Collector/SDM while acquiring land wherever feasible alternate land is available. All fees, stamp duties, taxes and other charges, as applicable under the relevant laws, incurred in the relocation and rehabilitation process, are to be borne by the EA/IA. Each titleholder family losing land will be entitled for following assistances.

1. One time resettlement allowance of Rs. 50,000.
2. One time assistance option from: (i) Where jobs are created through the project, employment for at least one member of the affected family with suitable training and skill development in the required field; or (ii) one-time payment of Rs. 500,000.

3. **Loss of Structures** will be compensated at replacement value with other assistance to the non-titleholders. The details of entitlement will be as:

1. Compensation for structure at the replacement cost to be calculated as per latest prevailing basic schedules of rates (BSR) without depreciation.
2. Right to salvage materials from structure and other assets with no deductions from replacement value.
3. One-time Resettlement allowance of Rs. 50,000
4. One-time financial assistance of Rs. 25,000 to the families losing cattle sheds for reconstruction

5. One time shifting assistance of Rs. 50,000 towards transport costs etc.

4. **Loss of livelihood due to loss of primary source of income** will be compensated through rehabilitation assistances. There are only non-titleholders in this project losing primary source of income. Details of entitlements for the above categories are described below:

1. One-time financial assistance of minimum Rs. 25,000, for skill up-gradation training to DPs opted for (one member of the affected family) income restoration.
2. Preference in employment under the project during construction and implementation.
3. Monthly Subsistence allowance of Rs. 3,000 for one year (total Rs. 36,000) from the date of award

4. **Loss trees and crops** will be compensated by cash compensation. The entitlements to the DPs losing trees will be compensated for trees based on timber value at market price, and compensation for perennial crops and fruit trees at annual net product market value multiplied by remaining productive years; to be determined in consultation with the Forest Department for timber trees and the Horticulture Department for other trees/crops. Since there is no land acquisition under the subproject, no loss of trees is envisaged.

5. **Additional assistance to vulnerable households** (Vulnerable households includes BPL, SC, ST, WHH, disabled and elderly and non-titleholders DPs) will be paid with special assistance as detailed below. The following provision in addition to the compensation for lost assets will ensure that the vulnerable people affected under the Project will be able to improve their standard of living or attain at least national minimal level.

1. One-time lump sum assistance of Rs. 25,000 to vulnerable households. This will be paid above and over the other.
2. Receive preference in income restoration training program under the project.
3. Preference in employment under the project during construction and implementation according to their acquired skills.
4. Access to basic utilities and public services.

5. **Loss of community infrastructure/common property resources** will be compensated either by cash compensation at replacement cost to the community (registered trust, society or village committee as appropriate) or reconstruction of the community structure in consultation with the affected community. CPP clearing and reconstruction including any ceremonial/religious expenses to relocate such structures will be undertaken by civil works contractors, and the associated costs are incorporated in their contracts.

6. **Temporary Impacts** on agricultural land due to plant site for contractor etc will be eligible for cash compensation for loss of income potential including:

1. Any land required by the Project on a temporary basis will be compensated in consultation with the landholders.
 2. Rent at market value for the period of occupation
 3. Compensation for assets at replacement cost
 4. Restoration of land to previous or better quality
 5. Location of construction camps will be fixed by contractors in consultation with Government and local community.
 6. 60 days advance notice regarding construction activities, including duration and type of temporary loss of livelihood.
 7. Cash assistance based on the minimum wage/average earnings per month for the loss of income/livelihood for the period of disruption, and contractor's actions to ensure there is no income/access loss consistent with the EMP.
 8. Assistance to mobile vendors/hawkers to temporarily shift for continued economic activity.
9. **Any unanticipated impacts** due to the project will be documented during the implementation phase and mitigated based on provision made in the Entitlement Matrix of this RP.
10. Entitlement Matrix
11. An Entitlement Matrix has been developed for the entire Bihar State Highways III Project and is applicable to phase II also. It summarizes the types of losses and the corresponding nature and scope of entitlements; and is in compliance with National/ State Laws and ADB SPS-2009 (**refer to Table 38**). Appropriate compensation and assistance will be fully paid prior to any physical or economic displacement.
12. All compensation and other assistances¹¹ will be paid to all DPs prior to commencement of civil works. After payment of compensation, DPs would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. The cost of salvaged materials will not be deducted from the overall compensation amount due to the DPs. A notice to that effect will be issued intimating that DPs can take away the materials.

¹¹ While compensation is required prior to dispossession or displacement of affected people from their assets, the full resettlement plan implementation, which may require income rehabilitation measures, might be completed only over a longer period of time after civil works have begun. Displaced people will be provided with certain resettlement entitlements, such as land and asset compensation and transfer allowances, prior to their displacement, dispossession, or restricted access.

Table 38: Entitlement Matrix

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
Land						
1-a	Loss of private land	Agricultural land ¹² , homestead land or vacant plot	Legal titleholders/ Family with traditional titleholders ¹³	Compensation at replacement cost or land-for-land where feasible. ¹⁴ If land-for-land is offered, titles will be in the name of original landowners. One time Resettlement allowance ¹⁵ of Rs. 50,000 per affected family ¹⁶ Each affected family shall be eligible	Compensation accounts for all taxes and fees, and does not account for any depreciation. Vulnerable households will be identified during the census.	The Valuation Committee will determine replacement value as per the procedures outlined in the subsequent sections of this document. PIU will ensure provision of notice. PIU will verify the extent of impacts through a 100% survey of DPs, determine

¹² The LARR, 2013 Act says no irrigated multi-cropped land shall be acquired under this Act, except in exceptional circumstances, as a demonstrable last resort. Wherever such land is acquired, an equivalent area of cultivable wasteland shall be developed for agricultural purposes or an amount equivalent to the value of land acquired shall be deposited with the appropriate Government for investment in agriculture for enhancing food-security. Such costing shall also reflect while preparing Resettlement Budget.

¹³ Traditional land rights refer to households with customary rights to land, and shall be treated equivalent to titleholders. The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 defines "Forest Dwelling Scheduled Tribes" as the members or community of the Scheduled Tribes who primarily reside in and who depend on the forests and forest lands for bona fide livelihood needs and includes the Scheduled Tribe pastoralist communities. The act provides right to in situ rehabilitation including alternative land in cases where the Scheduled Tribes and other traditional forest dwellers have been illegally evicted or displaced from forest land of any description without receiving their legal entitlement or rehabilitation prior to the 13th of December 2005.

¹⁴ Including option for compensation for non-viable residual portions.

¹⁵ The LARR Act-2013 specifies that each affected family shall be given one time Resettlement Allowance of Rs.50,000/- only. This is to cover transport and shifting.

¹⁶ 'Family' includes a person, his or her spouse, minor children, minor brothers and minor sisters dependent on him. Widows, divorcees and women deserted by families shall be considered separate family. An adult of either gender with or without spouse or children or dependents shall be considered as a separate family – as defined under LARR Act-2013.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				<p>for choosing one time assistance option from: (i) Where jobs are created through the project employment for at least one member of the affected family with suitable training and skill development in the required field; or (ii) One-time payment of Rs. 500,000 per affected family.</p> <p>1. Additional assistance to Vulnerable Households</p>	<p>1. Re-titling to be completed prior to project completion</p> <p>2. For option of choosing job created through project, job will be paid at living wage and monitored by CSC.</p>	<p>assistance, and identify vulnerable households.</p>
1-b	Loss of private land	Agricultural land, homestead land or vacant plot	Tenants and leaseholders (whether having written tenancy/lease documents or not / Sharecroppers	<p>Compensation for rental deposit or unexpired lease (such amount will be deducted from the compensation of land owners).</p> <p>3. Additional assistance to Vulnerable Households</p>	<p>Land owners will reimburse tenants and leaseholders land rental deposit or unexpired lease</p> <p>4. Vulnerable households will be identified during the census.</p>	<p>PIU will confirm land rental and ensure tenants and leaseholders receive reimbursement for land rental deposit or unexpired lease, and report to PIU. PIU will ensure provision of notice.</p>
1-c	Loss of Government land	Vacant plot, Agricultural land, homestead land	Leaseholders	<p>Compensation for rental deposit or unexpired lease (such amount will be deducted from the compensation of the lessee).</p> <p>5. Additional assistance to Vulnerable Households</p>	<p>6. Vulnerable households will be identified during the census.</p>	<p>PIU will ensure provision of notice and identify vulnerable households.</p>

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
1-d	Loss of Government land	Vacant plot, Agricultural land, homestead land, RoW of road	Non-Title Holders/Squatters ¹⁷ , Encroachers ¹⁸	7. At least 60 days advance notice to shift from occupied land 8. Notice to harvest standing seasonal crops and compensation. 9. Additional assistance to Vulnerable Households	10. Vulnerable households will be identified/verified during the RP implementation.	PIU will ensure provision of notice. PIU will identify vulnerable households.
Residential Structures¹⁹						
2-a	Loss of residential structure	Residential structure and other assets ²⁰	Legal titleholders Family with traditional land right	Each affected family shall be eligible for choosing one time assistance option from: 1. Replacement cost of the structure and other assets (or part of the structure and other assets, if remainder is viable); or 2. In Rural area, the displaced family will be provided with the option of constructed house as per Indira	Compensation accounts for all taxes and fees, and does not account for any depreciation. Vulnerable households will be identified/verified during the RP implementation.	Valuation committee will verify replacement value. PIU will verify the extent of impacts through a 100% survey of DHs determine assistance, verify and identify vulnerable households.

¹⁷ Squatters are those who have no recognizable rights on the land that they are occupying.

¹⁸ Encroachers are those who build a structure which is in whole or is part of an adjacent property to which he/she has no title. The vulnerability of these encroachers will be based on their other criteria except their NTH status.

¹⁹ Some of the entitlements under section are the same as previous rows as it is structured separately for each affected category and should not be duplicated in reading.

²⁰ Other assets include, but is not limited to walls, fences, sheds, wells, etc.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				<p>AawasYojana specifications in lieu of cash compensation;</p> <p>3. In Urban area, the displaced family will be provided with the option of constructed house of minimum 50 sq. m. plinth area in lieu of cash compensation.</p> <p>Fees, taxes, and other charges related to replacement structure.</p> <p>Right to salvage materials from structure and other assets with no deductions from replacement value.</p> <p>One-time Resettlement allowance of Rs. 50,000 per affected household</p> <p>One-time financial assistance of Rs. 25,000 to the families losing cattle sheds for reconstruction</p> <p>All displaced families will receive one time Shifting assistance of Rs. 50,000 towards transport costs etc.</p> <p>4. Additional assistance to Vulnerable Households</p>		
2-b	Loss of residential structure	Residential structure and other assets	Tenants and leaseholders	Replacement cost of part/whole of structure constructed by the tenant/leaseholder, and this will be deducted from the compensation amount of the owner.	Land/structure owners will reimburse tenants and leaseholders rental deposit or unexpired lease.	Valuation committee will verify replacement value. PIU will verify the extent of impacts through 100% surveys of DHs determine assistance, verify and identify

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				<p>Compensation for rental deposit or unexpired lease.</p> <p>Right to salvage materials (of the portion constructed by tenants or leaseholders) from structure and other assets</p> <p>One time Resettlement allowance of Rs. 50,000 per affected family</p> <p>One-time financial assistance of Rs. 25,000 to the families losing cattle sheds for reconstruction.</p> <p>All displaced families will receive one time Shifting assistance of Rs. 50,000 towards transport costs etc.</p> <p>5. Additional assistance to Vulnerable Households</p>	<p>Vulnerable households will be identified/verified during the RP implementation.</p>	vulnerable households.
2-c	Loss of residential structure	Residential structure and other assets	Non-Title Holders	<p>6. At least 60 days advance notice to shift.</p> <p>7. Replacement cost²¹ of structure without depreciation</p> <p>8. Right to salvage materials from structure and other assets</p>	Vulnerable households will be identified/verified during the RP implementation.	PIU will verify the extent of impacts through a 100% survey of DHs determine assistance, verify and identify vulnerable households.

²¹Replacement cost will be based on the following elements: (i) fair market value; (ii) transaction costs; (iii) interest accrued, (iv) transitional and restoration costs; and (v) other applicable payments, if any. Where market conditions are absent or in a formative stage, the borrower/client will consult with the displaced persons and host populations to obtain adequate information about recent land transactions, land value by types, land titles, land use, cropping patterns and crop production, availability of land in the project area and region, and other related information.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				without any cost 9. One time Resettlement allowance of Rs. 50,000 per affected family 10. All displaced families (squatters only) will receive one time shifting assistance of Rs. 50,000 towards transport costs etc. 11. Additional assistance to Vulnerable Households		
Commercial Structures						
3-a	Loss of commercial structure	Commercial structure and other assets	Legal titleholders Family with traditional land right	Replacement cost of the structure and other assets (or part of the structure and other assets, if remainder is viable) Fees, taxes, and other charges related to replacement structure. Right to salvage materials from structure and other assets with no deductions from replacement value. One time Resettlement allowance of Rs. 50,000 per affected family One-time financial assistance of Rs. 25,000 to the families losing shop for reconstruction of shop. All physically displaced families will receive one time Shifting assistance	Compensation accounts for all taxes and fees, and does not account for any depreciation. Vulnerable households will be identified during the census.	Valuation committee will determine replacement value. PIU will verify the extent of impacts through a 100% survey of DHs determine assistance, verify and identify vulnerable households.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				of Rs. 50,000 towards transport costs etc. 12. Additional assistance to Vulnerable Households		
3-b	Loss of commercial structure	Commercial structure and other assets	Tenants and leaseholders	<p>Replacement cost of part/whole of structure constructed by the tenant/leaseholder, and this will be deducted from the compensation amount of the owner.</p> <p>Compensation for rental deposit or unexpired lease.</p> <p>Right to salvage materials (of the portion constructed by tenants or leaseholders) from structure and other assets</p> <p>One time Resettlement allowance of Rs. 50,000 per affected family</p> <p>All displaced families will receive both: (i) One time Shifting assistance of Rs. 50,000 towards transport costs etc.; and (ii) monthly Subsistence allowance of Rs. 3,000 for one year (total Rs. 36,000) from the date of award</p> <p>13. Additional assistance to Vulnerable Households</p>	<p>Land/structure owners will reimburse tenants and leaseholders land rental deposit or unexpired lease.</p> <p>Vulnerable households will be identified during the census.</p>	Valuation committee will determine replacement value. PIU will verify the extent of impacts through a 100% survey of DHs determine assistance, verify and identify vulnerable households.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
3-c	Loss of commercial structure	Commercial structure and other assets	Non-Title Holders/Squatters, Encroacher	<p>Replacement cost of structure constructed by the squatter</p> <p>Right to salvage materials from structure and other assets</p> <p>One time Resettlement allowance of Rs. 50,000 per affected family</p> <p>All displaced families will receive one time Shifting assistance of Rs. 50,000 towards transport costs etc.</p> <p>Displaced families belong to Scheduled Caste (SC) and Scheduled Tribe (ST) will receive additional one-time Rs. 50,000 as subsistence allowance.</p> <p>14. Additional assistance to Vulnerable Households</p>	Vulnerable households will be identified during the census.	PIU will verify the extent of impacts through 100% surveys of DHs determine assistance, verify and identify vulnerable households.
Livelihood						
4	Loss of livelihood	Livelihood	<p>Legal titleholder losing business/ commercial establishment</p> <p>Family with traditional land right</p>	<p>15. One-time financial assistance of minimum Rs. 25,000.</p> <p>16. Skill up-gradation training to APs opted for (one member of the affected family) income restoration.</p> <p>17. Preference in employment under the project during construction and implementation.</p> <p>18. Monthly Subsistence allowance of Rs. 3,000 for one year</p>	Vulnerable households will be identified/verified during the RP implementation.	<p>PIU will verify the extent of impacts through a 100% survey of DHs determine assistance, verify and identify vulnerable households.</p> <p>For Agricultural laborer (long timer) Only those who are in fulltime / permanent employment</p>

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
			Commercial tenant Commercial leaseholder Employee in commercial establishment Agricultural laborer (long term) Artisans Commercial Squatters and Encroachers	(total Rs. 36,000) from the date of award 19. Additional assistance to Vulnerable Households		of the land owner will be eligible for this assistance. Seasonal agricultural laborers will not be entitled for this assistance.
Trees and Crops						
5	Loss of trees and crops	Standing trees and crops	Legal titleholder Family with traditional land right Agricultural tenant/ leaseholder Sharecroppers Non-Title Holders Squatter	20. Advance notice of 60 days to harvest crops, fruits, and timbers. 21. Compensation for standing crops in case of such loss, based on an annual crop cycle at market value 22. Compensation for trees based on timber value at market price, and compensation for perennial crops and fruit trees at annual net product market value multiplied by remaining productive years; to be determined in consultation with the Forest Department for timber trees and the Horticulture Department for	Harvesting prior to acquisition will be accommodated to the extent possible Work schedules will avoid harvest season. Seasonal crops will be given at least 60 days' notice. If notice cannot be given, compensation for standing crops will be compensated at market value. Market value of trees/crops has to be determined.	PIU will ensure provision of notice. Valuation Committee will undertake valuation of standing crops, perennial crops and trees, and finalize compensation rates in consultation with DPs.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				other trees/crops.		
Vulnerable						
6	Impacts on vulnerable APs	All impacts	Vulnerable APs	<p>23. One-time lump sum assistance of Rs. 25,000 to vulnerable households. This will be paid above and over the other assistance provided in items 1, 2, 3, 4 and 5.</p> <p>24. Receive preferential in income restoration training program under the project.</p> <p>25. Preference in employment under the project during construction and implementation.</p> <p>26. Access to basic utilities and public services</p>	Vulnerable households will be identified/verified during the RP implementation.	<p>PIU will verify the extent of impacts through 100% surveys of DHs determine assistance, verify and identify vulnerable households.</p> <p>The PIU with support from the PM/AE and RP Implementation agency²² will conduct a training need assessment in consultations with the displaced persons so as to develop appropriate income restoration schemes.</p> <p>Suitable trainers or local resources will be identified by PIU and RP implementation agency in consultation with local training institutes.</p>
Temporary Loss						

²²When suitable agency is not available, the PIU will be staffed with qualified and experienced social workers to assist the IA in RP implementation

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
7	Temporary loss of land ²³	Land temporarily required for sub-project construction	Legal titleholders Family with traditional land right	27. Any land required by the Project on a temporary basis will be compensated in consultation with the landholders. 28. Rent at market value for the period of occupation 29. Compensation for assets at replacement cost 30. Restoration of land to previous or better quality ²⁴ . 31. Location of construction camps will be fixed by contractors in consultation with Government and local community.	Assessment of impacts if any on structures, assets, crops and trees due to temporary occupation. Site restoration.	Valuation Committee will determine rental value and duration of construction survey and consultation with DPs. PIU will ensure compensation is paid prior to site being taken-over by contractor. Contractor will be responsible for site restoration.
8	Temporary disruption of livelihood		Legal titleholders, non-titled APs	32. 60 days advance notice regarding construction activities, including duration and type of disruption. 33. Cash assistance based on the average earnings per month for the loss of income/livelihood for the period of disruption, and contractor's actions to ensure there is no income/access loss consistent with the EMP. ²⁵	Identification of alternative temporary sites to continue economic activity.	Valuation Committee will determine income lost. Contractors will perform actions to minimize income/access loss.

²³Temporary possession of land for project purpose can be taken only for three years from the date of commencement of such possession/occupation.

²⁴ If the land has become permanently unfit to be used for the purpose for which it was used immediately before the commencement of such term, and if the persons interested shall so require, the appropriate Government shall proceed under the Act to acquire the land as if it was needed permanently for a public purpose.

²⁵ This includes: leaving spaces for access between mounds of soil, providing walkways and metal sheets to maintain access across trenches for people and vehicles where required, increased workforces to finish work in areas with impacts on access, timing of works to reduce disruption during business hours, phased construction schedule and working one segment at a time and one side of the road at a time.

S.N.	Type of Loss	Application	Definition of Entitled Person	Compensation Policy	Implementation Issues	Responsible Agency
				34. Assistance to mobile vendors/hawkers to temporarily shift for continued economic activity. ²⁶		
Common Resources						
9	Loss and temporary impacts on common resources	Common resources	Communities	35. Replacement or restoration of the affected community facilities – including public water stand posts, public utility posts, temples, shrines, etc.	Follow ADB SPS	PIU and Contractor.
Other						
10	Any other loss not identified	-	-	36. Unanticipated involuntary impacts will be documented during the implementation phase and mitigated.	-	PIU will finalize the entitlements in line with ADB's SPS, 2009.

²⁶For example, assistance to shift to the other side of the road where there is no construction.

7. RELOCATION OF HOUSING AND SETTLEMENTS

1. Basic Provision for Relocation

2. The EA will provide adequate and appropriate replacement of structures or cash compensation at full replacement cost for lost structures, adequate compensation for partially damaged structures, and relocation assistance, according to the Entitlement Matrix. The EA will compensate to the non-titleholders for the loss of assets other than land, such as dwellings, and also for other improvements to the land, at full replacement cost.

3. Need for Relocation

4. Despite being a linear project and efforts made to minimize the resettlement impacts, the proposed project will affect residential and commercial structures as a result of which both physical and economic displacement will arise and need of relocation in the project. Efforts are made through various provisions in this resettlement plan to mitigate negative social impacts caused up on displaced persons and communities by supporting relocation of affected households and by restoration of income to national minimum standard.

5. In the project, 292 residential structures owned by 223 households, 168 commercial structures owned by 153 households, 15 residential-cum-commercial structures owned by 13 households and 95 other private structures owned by 71 households are being affected as shown in table below.

Table 39: Loss of Private Structure

Sl. No.	Type of Structure	No. of Structure	DHs
1	Residential Structure	292	223
2	Commercial Structure	168	153
3	Resi+Commercial Structure	15	13
4	Other Private Structure	95	71
Total		570	460

6. Relocation and Compensation Option by DPs

7. To understand and know the relocation options, DPs were consulted during the census survey and out of total 649 households 437 (67%) have opted for self-relocation and 33% have opted for project-based relocation. The choice of DPs is further supported by their compensation option as maximum (95%) opted cash compensation against loss of their structure. The details are given in **Table 40**.

Table 40: DPs Choice on Relocation and Compensation

Sl. No.	Relocation Options	No. of Households	%	Compensation Option	No. of Households	%
1	Self-Relocation	437	67.33	Structure for Structure loss	30	4.62
2	Project Assisted Relocation	212	32.67	Cash for Structure loss	619	95.38
Total		649	100.0	100.00	649	100.0

8. Relocation Strategy

9. With the scattered nature of resettlement impacts the residential structures affected in the project are spread all along the sub project road. Most of the DPs preferred for cash compensation and self-relocation and during the focused group discussion, while discussing about relocation options people were very much in favour of resettlement within the village to avoid disruption of community life and problem with host community. Therefore, cash compensation at market rate along with relocation assistances is adopted as more practical solution in this case.

10. All the structures affected in the project as per provisions made in the entitlement matrix will be eligible for the following:

1. Compensation for structure will be paid at the replacement cost to be calculated as per latest prevailing basic schedules of rates (BSR) without depreciation,
2. One-time Resettlement allowance of Rs. 50,000 per affected household
3. Shifting assistance to all structures at @ of Rs. 50,000 per structure,
4. Right to salvage materials from structure and other assets with no deductions from replacement value, and

11. To help the DPs losing structures in getting all above entitlements and relocating themselves, following relocation strategy will be adopted in the project:

1. At least 60 days advance notice before demolition of structure.
2. Their dismantled structures materials will not be confiscated and they will not pay any fine or suffer any sanction.
3. The RP implementing agency engaged for RP implementation will assist DPs during verification of assets and will provide necessary counseling on payment of compensation and assistance.

4. The RP implementing agency will assist the project authorities in ensuring a smooth transition (during the part or full relocation of the DPs), helping the DPs to take salvaged materials and shift.
 5. In close consultation with the DPs, the RP implementing agency will fix the shifting dates agreed with the DPs in writing and the arrangements desired by the DPs with respect to their entitlements.
 6. In case of self-relocation also, the RP implementing agency will assist the DPs in finding alternative land within the village if so desired by the DPs in consultation with village committee and other beneficiaries in the villages.
12. Relocation Strategy for CPR
13. There are 29 common property resources reported to be affected under the sub-project as provided in table 18 of this RP. The CPRs will be compensated either by cash compensation at replacement cost to the community (registered trust, society or village committee as appropriate) or reconstruction of the community structure in consultation with the affected community. CPI clearing and reconstruction including any ceremonial/religious expenses to relocate such structures will be undertaken by civil works contractors, and the associated costs are incorporated in their contracts.

8. INCOME RESTORATION AND REHABILITATION

1. Loss of Livelihoods in the Project

2. The project impacts reveal that due to loss of land and commercial structures 371 households will experience loss of their livelihood. As per the findings of census survey, 189 owners of agriculture land, 153 owners of commercial structures, 13 owners of residential cum-commercial structures and 16 tenants doing business activity will be losing their livelihood due to the project. The details of impact on livelihoods in the project are summarized in the **Table 41**.

Table 41 : Loss of Livelihoods in the Project

Sl. No.	Loss	Households
1	Owners of Agricultural Land	189
2	Agricultural Labourer	0
3	Agricultural Tenants/ Leaseholders	0
4	Sharecropper	0
5	Loss of Commercial Structure	153
6	Loss of Residential cum Commercial Structure	13
7	Commercial Tenants	16
8	Employees in Structures	0
Total		371

3. The above table shows that out of total DPs about 56% households are losing livelihood under the subproject. Income losses due to loss of commercial structure will be restored in a sustainable manner; in addition to subsistence allowance and livelihood allowance, DPs will be provided with skill up-gradation and training.

4. Provisions for Loss of Livelihood

5. The DPs losing their livelihoods include titleholders losing land and structures, non-titleholders having commercial structures, and commercial tenants in affected commercial structures and land under the project. In the case of economically displaced persons, regardless of whether or not they are physically displaced, the EA will promptly compensate for the loss of income or livelihood sources at full replacement cost. The EA will also provide assistance such as credit facilities, training, and employment opportunities so that they can improve, or at least restore, their income-earning capacity, production levels, and standards of living to national minimum standard. The RP implementing agency will prepare the micro plan with specific income restoration activities for each DP at such appropriate time to enable the DPs to initiate restore their income in line with the construction schedule.

6. In cases where land acquisition affects commercial structures which are required to be relocated, affected business owners are entitled to:

1. the costs of reestablishing commercial activities elsewhere;
2. the subsistence allowance lost during the transition period; and
3. the costs of transferring the plant, machinery, or other equipment.

4. Business owners with legal rights or recognized or recognizable claims to land where they carry out commercial activities are entitled to replacement property of equal or greater value or cash compensation at full replacement cost. Non-titleholder households losing business structure and livelihood will be compensated for the structure loss and receive transitional assistance as well. The IA will ensure that no physical displacement or economic displacement will occur until:

1. compensation at full replacement will be paid to each displaced person for project components or sections that are ready to be constructed;
2. other entitlements listed in the resettlement plan have been provided to displaced persons; and
3. a comprehensive income and livelihood rehabilitation program, supported by an adequate budget, is in place to help displaced persons improve, or at least restore, their incomes and livelihoods.

4. Income Restoration Measures

5. The entitlement proposed for the project has adequate provisions for restoration of livelihood of the affected communities. The focus of restoration of livelihoods is to ensure that the DPs are able to at least regain national minimum standards. To restore and enhance the economic conditions of the DPs, certain income generation and income restoration programs are incorporated in the RP. To begin with providing employment to the local people during the construction phase will enable them to benefit from the project, reduce the size of intrusive work forces and keep more of the resources spent

on the project in the local economy. It will also give the local communities a greater stake and sense of ownership in the project.

6. Among specific rehabilitation measures, capacity building of all the economically displaced persons will be carried out by the project authority. The RP implementing agency to be engaged under the Project will identify the eligible and most suitable candidate from the family by carry out training need assessment and prepare micro plan for rehabilitation of DPs. The RP implementing agency will impart training to the selected/eligible DPs for income restoration and skill up-gradation as per the micro plan. The EA will also provide opportunities to displaced persons to derive appropriate development benefits from the project. The vulnerable DPs will be given preference in availing employment opportunities in project construction work. The women headed households also will be taken care of in a case-to-case basis and the RP implementing agency will help them in forming Self-help Groups (SHGs), establish linkages to available credit facilities, special trainings, and linking them with ongoing govt. schemes. Budget for training in terms of assistance is provided to DPs losing livelihoods and the RP implementing agency will either organize training programs by employing appropriate resource persons or link the DPs to various ongoing training schemes. Fund for training is provided in the R&R budget keeping in view the average expenditure for ongoing training programs in the project area.

7. Additional Support from Ongoing Poverty Reduction Programs

8. In addition to project-sponsored programs, the RP implementing agency will play a proactive role to mobilize DPs to get benefits from various government schemes National Farmer Policy, animal husbandry and dairy development, development of inland fisheries and agriculture, providing kishan credit card, agriculture insurance schemes etc. and ensure their accessibility particularly of vulnerable groups. The RP implementing agency will work with the panchayat governments to make available to the DPs benefits of some of the ongoing pro-poor programs for poverty reduction.

9. RESETTLEMENT BUDGET AND FINANCING PLAN

1. Introduction

2. The resettlement cost estimate for this project includes eligible compensation, resettlement assistance and support cost for RP implementation. The support cost, which includes staffing requirement, monitoring and reporting, involvement of RP implementing agency in project implementation and other administrative expenses are part of the overall project cost. The unit cost for structures and other assets in this budget has been derived through field survey, consultation with affected families, relevant local authorities and reference from old practices. Contingency provisions have also been made to take into account variations from this estimate. Some of the major items of this R&R cost estimate are outlined below:

1. Compensation for agricultural, residential and commercial land at their replacement value
2. Compensation for structures (residential/ commercial) and other immovable assets at their replacement cost
3. Compensation for trees
4. Subsistence assistance in lieu of the loss of business and livelihood
5. Assistance in lieu of the loss of business/ wage income/ employment and livelihood
6. Assistance for shifting of the structures
7. Resettlement and Rehabilitation Assistance in the form of Training allowance
8. Special assistance to vulnerable groups for their livelihood restoration
9. Cost for implementation of RP.

10. Compensation

11. **Private Land:** For the purpose of cost estimate, the unit rate for agricultural land has been estimated on the basis of latest official rate and prevailing market value assessment during census survey. However, the actual compensation for land at replacement cost will be determined by District Collector. For cost estimates of land multiplying factor is taken 1 for urban areas while it is considered as 2 in case of rural areas.

12. **Residential/ Commercial and other structures:** For the purpose of cost estimate, average rates of various types of structures are estimated on the basis of latest BSR and market assessment. The average rate for permanent structures without land has been calculated at Rs. 15,000/m², semi-permanent structures have been calculated at Rs. 10,000/m², and temporary structures have been calculated at the rate of Rs. 5,000/m². However, the actual compensation will be calculated by the professional valuer taking into account the latest BSR without depreciation.

13. **Compensation for tree:** For cost estimate the rate for fruit and non-fruit trees are computed as Rs. 15,000 and Rs. 8,000 per tree. However, the revenue department will calculate the actual cost of trees during field verification.

14. Assistance

15. All title-holder DPs losing land and non-titleholder DPs losing structures will be eligible for onetime resettlement allowance of Rs. 50,000/- (Rupees Fifty Thousand Only) per affected family.

16. Titleholder DPs losing land will be eligible for onetime assistance of Rs. 5,00,000/- (Rupees Five Lakh Only) per affected family.

17. Titleholder DPs losing structure, non-titleholder DPs losing structures (squatters only) and tenants will be eligible for onetime shifting assistance of Rs. 50,000/- (Rupees Fifty Thousand Only) towards transport costs.

18. DPs losing cattle shed will be eligible for Rs. 25,000/- (Rupees Twenty-Five Thousand Only) as assistance for reconstruction of cattle shed.

19. All DPs losing livelihood will be eligible for monthly subsistence allowance of Rs. 3,000/- per month for a period of one year from the date of award i.e., Rs. 36,000/- (Rupees Thirty-Six Thousand Only) per affected family.

20. All DP losing livelihood will be eligible for onetime financial assistance of minimum Rs. 25,000/- (Rupees Twenty-Five Thousand Only) per affected family.

21. Skill up-gradation training to DPs (one member of the affected family) opted for income restoration. Based on the prevailing training expenditure Rs. 10,000/- (Rupees Ten Thousand Only) per families losing livelihood.

22. Additional onetime assistance of Rs. 25,000 (Rupees Twenty-Five Thousand Only) per affected vulnerable family.

23. Compensation for Community and Government Property

24. The inventory of CPR was conducted under the census survey and the list of the affected CPRs are provided in Appendix 3. CPR clearing and reconstruction including any ceremonial/religious expenses to relocate such structures will be undertaken by civil works contractors, and the associated costs are incorporated in their contracts.

25. RP Implementation and Support Cost

26. The unit cost for hiring of the RP implementing agency has been calculated on a lump sum basis for Rs. 6,00,00,000/- (Rupees Sixty Lakhs Only). The service of RP implementing agency will be required for 2 to 3 years period. Costs will be updated during implementation if required. A 5% contingency has been added in order to adjust any cost escalation during project implementation. For grievance redress process and carrying out consultation during project implementation a lump sum of Rs. 1,00,00,000/- (Rupees Ten Lakhs only) is provided. The other cost of RP implementation and administrative activities will be a part of existing departmental expenditure. For hiring of an external monitoring agency/expert a lump sum Rs. 1,50,00,000 (Rupees Fifteen Lakhs only) has been made.

27. R&R Budget

28. The total R&R budget for the proposed project RP works out to Rs 714.3 million. A detailed indicative R&R cost is given in **Table 42**.

Table 42: R&R Budget

Sl. No.	Item	Unit	Rate	Amount
A Compensation for Land		in Acre		in Rupees
1	Compensation for Private Land in Rural Area	67.77	Varied	66,513,248
			Multiplied by factor 2	133,026,496
			100% solatium	266,052,992
Subtotal A				266052992
B Compensation for Structure		in Sq. mtr./mtr.	Rupees	
1	Compensation for Permanent Structure	1,369	15,000	20,535,000
2	Compensation for Semi-Permanent Structure	3,983	10,000	39,830,000
3	Compensation for Temporary Structure	4,343	5,000	21,715,000
4	Compensation for Boundary Wall	152	2,000	304,000
Subtotal B				82384000
C	Compensation for Trees	Number	Rupees	
1	Fruit Bearing Tree	119	15,000	1,785,000
2	Non-fruit bearing	224	8,000	1,792,000
Subtotal C				3,577,000
D	Assistance	Number		
1	One time assistance to land titleholder	453	500,000	226,500,000
2	Resettlement allowance to all DPs	665	50,000	33,250,000

3	Shifting assistance to DPs losing structure & Tenants	460	50,000	23,000,000
4	One time allowance for skill upgradation to DPs losing Livelihood	371	25,000	9,275,000
5	Subsistence allowance to DPs losing Livelihood	371	36,000	13,356,000
6	Special assistance to Vulnerable DPs	553	25,000	13,825,000
7	Assistance for reconstruction of cattle shed	23	25,000	575,000
Subtotal D				319781000
E	RP Implementation Support Cost	Number		
1	Hiring of RP Implementation Agency	1	6,000,000	6,000,000
2	Grievance Redressal & Consultation Cost	Lump sum	1,000,000	1,000,000
3	Hiring External Monitoring Agency/Expert	1	1,500,000	1,500,000
Subtotal E				8,500,000
Total (A+B+C+D+E)				680,294,992
Contingency (5%)				34,014,749.6
GRAND TOTAL				714,309,741.6

29. Source of Funding and Fund Flow Management

30. The cost related to resettlement will be borne by the EA. The EA will ensure allocation of funds and availability of resources for smooth implementation of the project R&R activities. The EA will, in advance, initiate the process and will try to keep the approval for the R&R budget in the fiscal budget through the ministry of finance. In the case of assistance and other rehabilitation measures, the EA will directly pay the money or any other assistance as stated in the RP to DPs. The RP implementing agency will be involved in facilitating the disbursement process and rehabilitation program.

10. GRIEVANCE REDRESS MECHANISM

1. Introduction

2. In the project RP implementation, there is a need for an efficient grievance redress mechanism that will assist the DPs in resolving their queries and complaints. Therefore, formation of Grievance Redress Committee (GRC) will be most important for grievance redress and it is anticipated that most, if not all grievances, would be settled by the GRC.

3. Grievance Redress Mechanism

4. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate and facilitate the resolution of displaced people's concerns, complaints and grievances about the social and environmental performance at the level of the Project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. The project-specific GRM is not intended to bypass the government's own redress process, rather it is intended to address displaced people's concerns and complaints promptly, making it readily accessible to all segments of the displaced people and is scaled to the risks and impacts of the project.

5. During project preparation, information regarding GRCs will be disclosed as part of the public consultation process. Grievances related to the implementation of the project will be acknowledged, evaluated, and responded to the complainant with corrective action proposed. The outcome shall also form part of the semi-annual monitoring report that will be submitted to ADB. The decision of the GRCs is binding, unless vacated by the court of law. The GRC will continue to function, for the benefit of the DPs, during the entire life of the project including the maintenance period.

6. Constitution and Function of the GRC

7. The GRC will be headed by the District Collector (DC) or his designated representative. The GRC will have representative from the PIU office, representatives of DPs, particularly of vulnerable DPs, local government representatives, representative of local NGOs and other interest groups. The GRC will meet at least once in each 15 days. Other than disputes relating to ownership rights under the court of law, GRC will review grievances involving all resettlement benefits, compensation, relocation, and other assistance. At least one member from each Panchayat will be a woman. The Committee will co-opt a member from each of the affected Panchayat institution when dealing with matters coming from a particular panchayat. Some of the specific functions of the GRC will be as following:

1. To provide support for the DPs on problems arising out of land/property acquisition like award of compensation and value of assets;
2. To record the grievances of the DPs, categorize and prioritize the grievances that needs to be resolved by the Committee and solve them within a month;
3. To inform PIU of serious cases within an appropriate time frame; and
4. To report to the aggrieved parties about the development regarding their grievance and decision of PIU.

5. It is proposed that GRC will meet regularly (at least twice in a month) on a pre-fixed date. The committee will look into the grievances of the people and will assign the responsibilities to implement the decisions of the committee. The claims will be reviewed and resolved within 15 days from the date of submission to the committee. All Grievances will be routed through the RP implementing agency to

the GRC. Through public consultations, the DPs will be informed that they have a right to grievance redress. The DPs can call upon the support of the RP implementing agency to assist them in presenting their grievances or queries to the GRC. The RP implementing agency will act as an in-built grievance redress body. The DPs, who would not be satisfied with the decision of the GRC, will have the right to take the grievance to the BSRDC Head Office for its redress. Failing the redressal of grievance at BSRDC, the DPs may take the case to Judiciary. Taking grievances to Judiciary will be avoided as far possible and the RP implementing agency will make utmost efforts at reconciliation at the level of GRC. All grievances received (written or oral) and their redress will be recorded and documented properly. The EA will ensure that, such records will be made available to the external monitor or ADB review mission on request. All the GRC related expenses will be borne by the project.

6. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.²⁷

11. INSTITUTIONAL ARRANGEMENT

1. Institutional Requirement

2. For implementation of RP there will be a set of institutions involve at various levels and stages of the project. For successful implementation of the RP the proposed institutional arrangement with their role and responsibility has been outlined in this section. The primary institutions, who will be involved in this implementation process, are the following:

1. Bihar State Road Development Corporation (BSRDC), Government of Bihar
2. Project Implementation Unit (PIU)
3. RP Implementing Agency
4. Village Level Committee (VLC)
5. District Grievance Redress Committee (GRC)
6. Construction Supervision Consultant (CSC)/Authority Engineer (AE)

7. Executing Agency

8. The Executing Agency (EA) for the Project is BSRDC, Government of Bihar. The EA, headed by MD will have overall responsibility for implementation of loan and will also be responsible for the overall coordination among ADB, Government of Bihar. BSRDC has already set up a Project Implementation Unit (PIU) for implementation for the project which will be functional for the whole Project duration.

9. Resettlement Management at PIU

10. For resettlement activities, PIU will do the overall coordination, planning, implementation, and financing and monitoring. The PIU is headed by Deputy General Manager (DGM) and assisted by two Managers. Each of the Managers will be responsible for looking after the Land Acquisition and R&R activities of respective sections i.e. North and South sections. The PIU will hire an RP implementing agency for supporting implementation of resettlement activities in the project. The PIU will maintain all databases, work closely with DPs and other stakeholders and monitor the day today resettlement activities. Some of the specific functions of the PIU with regards to resettlement management will include:

11. Overall responsibility of implementation and monitoring of R&R activities in the Project;
12. Ensure availability of budget for R&R activities;
13. Liaison lined agencies support for land acquisition and implementation of RP;
14. Selection and appointment of the RP implementing agency.
15. Coordinating with line Departments, PIU, RP implementing agency and CSC/AE.
16. Monitor physical and financial progress on land acquisition and R&R activities;
17. Participate in regular meetings in GRC; and
18. Organize monthly meetings with the RP implementing agency to review the progress on R&R

19. RP implementing agency

20. Involuntary resettlement is a sensitive issue and strong experience in R&R matters along with community related skills will be required by the PIU in order to build a good rapport with the affected community and facilitate satisfactory R&R of the DPs. To overcome this deficiency, experienced and well-qualified RP implementing agency in this field will be engaged to assist the PIU in the

implementation of the RP. The RP implementing agency would play the role of a facilitator and will work as a link between the PIU and the affected community. RP implementing agency will assist DPs in income restoration by preparing micro plan and guiding to access into various ongoing government development schemes and agencies providing financial assistance and loan. Taking into account the significant role of the RP implementing agency in RP implementation, it is extremely important to select the agency that are capable, genuine and committed to the tasks assigned in order to ensure the success of the Plan. The Terms of Reference for the RP implementing agency is appended as **Appendix: 6.**

21. The roles and responsibilities of various agencies to be involved in resettlement planning process and implementation of resettlement activities are summarized in **Table 43.**

Table 43 : Agencies Responsible for Resettlement Implementation

Key Agency	Responsibility
EA (BSRDC)	<ol style="list-style-type: none"> 1. Make final decision on roads to be included under the project 2. Overall responsibility for project design, feasibility, construction and operation and guide PIU 3. Ensure that sufficient funds are available to properly implement all agreed social safeguards measures 4. Ensure that all project comply with the provisions of ADB's SPS 2009 and Gol's policies and regulations 5. Submit semi-annual safeguards monitoring reports to ADB
Project Implementation Unit (PIU)	<p>(a) District Level</p> <ol style="list-style-type: none"> 6. Disseminate project information to the project affected community with assistance from DPR Consultants 7. Ensure establishment of Grievance Redress Committee at the district level for grievance redress with assistance from DPR Consultants <p>(b) Field Level</p> <ol style="list-style-type: none"> 8. Disclosure of project information in public spaces and through relevant media. 9. Disseminate project information to the community in coordination with DPR Consultants 10. Facilitate the socioeconomic survey and census 11. Facilitate consultation by the civil works contractor with community throughout implementation 12. Oversee land acquisition and coordinate with Deputy Commissioner 13. Supervise the mitigation measures during implementation and its progress 14. Conduct internal monitoring and prepare reports
Detailed Project Report (DPR) Consultants	<ol style="list-style-type: none"> 15. Undertake consultations involving community and DPs 16. Prepare due diligence report if no land acquisition 17. Encourage community/ DPs to voluntarily participate during the implementation
RP Implementing Agency	<ol style="list-style-type: none"> 1. Assist in the implementation of the RP if involuntary resettlement is identified.
Construction Supervision Consultant	<ol style="list-style-type: none"> 2. Provide technical support and advise to the IAs in the implementation of the RP specifically for addressing complaints and grievances and participate in resolving issues as a member of the GRC

Key Agency	Responsibility
(CSC)/ Authority Engineer (AE)	3. Monitor and assist the RP implementing agency by providing Technical Support and advice during implementation of RP. 4. Provide technical advice and on the job training to the contractors as necessary 5. Preparation of semi-annual monitoring reports based on the monitoring checklists and submission to RDA for further submission to ADB 6. Act as External Monitor for project with significant impact
Contractor	7. Consult community and PIU regarding location of construction camps 8. Sign agreement with titleholder for temporary use of land and restore the land to equal or better condition upon completion 9. Commence construction only when alignment is free of encumbrance 10. Respond in a timely fashion to recommendations from GRCs
District level officials	11. Provide any existing socioeconomic information, maps and other related information to DPR Consultant prior to the field data/information collection activities. 12. Act as the local focal point of information dissemination 13. Execute land acquisition process
Community Based Organizations	14. Ensure the community participation at various stages of the project 15. Coordination with stakeholder organizations 16. Assist in Monitoring of the project 17. Providing indigenous knowledge as required
Village Level Committee	18. Provide correct and accurate data and information from project formulation stage 19. Assist the project team to implement the project smoothly 20. Arrange proper community participation
ADB	21. Review due diligence report/RP and endorse or modify the project classification 22. Review planning documents and disclose the draft and final reports on the ADB's website as required 23. Monitor implementation through review missions 24. Provide assistance to the EA and IA of project, if required, in carrying out its responsibilities and for building capacity for safeguard compliance 25. Monitor overall compliance of the project to ADB SPS

26. Capacity Building on RP in the EA

27. The BSRDC has already established a PIU headed by a DGM dealing with the land acquisition and resettlement for other projects. These officers have been working closely with the consultant team for the preparation of RP. The designated officials from BSRDC were also actively participated during the preparation of LA Plan and census survey. Capacity building training was also initiated through a series of consultations and informal orientation sessions in the local administration level especially in the local revenue offices. The concerned district collector was also informed about the project and the local revenue officials were consulted for collection of relevant land data and land holders' details. During, the preparation of RP and especially, during the land acquisition and resettlement survey, concerned officials were informed about their role during the implementation of RP particularly during the disbursement of compensation, assistance and relocation etc.

28. To allow an effective execution of all RP related tasks some expansion of the capacity on RP currently available at EA/PIU may be needed. As soon as the project will become effective BSRDC will carry out a capacity need assessment and will define the capacity building activities and if needed the

additional experts required. All concerned staff at PIU level involved in land acquisition and resettlement activities will undergo an orientation and training in ADB resettlement policy and management. The ADB's PPTA consultant's resettlement specialist will organize a training workshop and provide training to the PIU staff. Broadly, the training will cover various topics such as (i) Principles and procedures of land acquisition; (ii) Public consultation and participation; (iii) Entitlements and compensation & assistance disbursement mechanisms; Grievance redress; and (iv) Monitoring of resettlement operations. These will be covered through a formal workshop by the consultant under the ongoing technical assistance program. The specific components under the training will cover the following:

29. Understanding of the ADB Policy Guidelines and requirements and differences between country policy and laws
30. Understanding of the policy and procedure adopted for the Project
31. Understanding of the Implementation Schedule activities step-by-step
32. Understanding of the Monitoring and reporting mechanism
33. Understanding of the economic rehabilitation measures

12. IMPLEMENTATION SCHEDULE

1. Introduction

2. Implementation of RP mainly consists of compensation to be paid for affected structures and rehabilitation and resettlement activities. The time for implementation of resettlement plan will be scheduled as per the overall project implementation. All activities related to the land acquisition and resettlement must be planned to ensure that compensation is paid prior to displacement and commencement of civil works. The EAs and PIUs will ensure that no physical or economic displacement of displaced households will occur until: (i) compensation at full replacement cost has been paid to each displaced person for project components or sections that are ready to be constructed; (ii) other entitlements listed in the resettlement plan are provided to the displaced persons; and (iii) a comprehensive income and livelihood rehabilitation program, supported by adequate budget, is in place to help displaced persons, improve, or at least restore, their incomes and livelihoods. Furthermore, all RPs will be revised during detailed design, and the updated RPs will be approved by government and ADB and disclosed prior to implementation. Public consultation, monitoring and grievance redress will be undertaken intermittently throughout the project duration. However, the schedule is subject to modification depending on the progress of the project activities. The civil works contract for each project will only be awarded after all compensation and relocation has been completed for project and rehabilitation measures are in place.

3. Schedule for Project Implementation

4. The proposed project R&R activities are divided into three broad categories based on the stages of work and process of implementation. The details of activities involved in these three phases like Project Preparation phase, RP Implementation phase, Monitoring and Reporting period are discussed in the following paragraphs.

5. Project Preparation Phase

6. The major activities to be performed in this period include establishment of PIU at project level; submission of RP for ADB approval; appointment of RP implementation agency and establishment of GRC etc. The information campaign and community consultation will be a process initiated from this stage and will go on till the end of the project.

7. RP Implementation Phase

8. After the project preparation phase the next stage is implementation of RP which includes issues like compensation of award by EA; payment of all eligible assistance; relocation of DPs; initiation of economic rehabilitation measures; site preparation for delivering the site to contractors for construction and finally starting civil work.

9. Monitoring and Reporting Period

10. As mentioned earlier the monitoring will be the responsibility of PIU and RP implementing agency and will start early during the project when implementation of RP starts and will continue till the completion of the project. Keeping in view the significant involuntary resettlement impacts, an external monitoring and reporting expert will be hired for the project.

11. R&R Implementation Schedule

12. A composite implementation schedule for R&R activities in the project including various sub tasks and time line matching with civil work schedule is prepared and presented in the form of **Table 44**. However, the sequence may change or delays may occur due to circumstances beyond the control of the Project and accordingly the time can be adjusted for the implementation of the plan. The implementation schedule can also be structured through package wise. The entire stretch can be

divided in to various contract packages and the completion of resettlement implementation for each contract package shall be the pre-condition to start of the civil work at that particular contract package.

Table 44. R&R Implementation Schedule

Sl. No.	Activity	2021				2022				2023				2024			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Preparation																	
1	Conduct census survey																
2	Preparation of RPs																
3	ADB and Government approval of RP																
4	Procurement of RP implementation agency																
5	Procurement of civil works																
Land Acquisition																	
6	Payment of Compensation																
7	Relocate houses, shops, businesses																
8	Clear the ROW																
Income Restoration																	
9	Income Restoration																
10	Restoration of Community Resources																
Construction																	
11	Issue notice for start of civil works																
12	Civil works																
Ongoing Activities																	

8. The monitoring of RP will be undertaken by external monitor hired by the EA. However, as experienced in some of the previous projects the Social Development Monitoring Expert of the CSC/Authority Engineer can also be engaged and in that case the cost mentioned in the R&R budget will be adjusted accordingly. The main objective of this monitoring is to supervise overall monitoring of the project and submit a biannual report to determine whether resettlement goals have been achieved, more importantly whether livelihoods and living standards have been restored/ enhanced and suggest suitable recommendations for improvement. The external monitoring consultant will be mobilized within three months of loan approval and the monitoring will be carried out intermittently during the RP implementation. The external monitor will assess resettlement outcomes, their impacts on the standards of living of displaced persons, and whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. The EM will undertake a post-resettlement evaluation of the effectiveness of RP implementation with comparison to baseline information.

9. The ToR for External monitoring is attached as **Appendix: 6**. The key tasks during external monitoring will include:

1. Review and verify the monitoring reports prepared by PIU;
2. Review of socio-economic baseline census information of pre-displaced persons and conduct (if necessary) baseline survey;
3. Identification and selection of impact indicators;
4. Impact assessment through formal and informal surveys with the displaced persons;
5. Consultation with DPs, officials, community leaders for preparing review report;
6. Assess the resettlement efficiency, effectiveness, impact and sustainability, drawing lessons for future resettlement policy formulation and planning.

7. The following should be considered as the basis for indicators in monitoring of the project:

8. socio-economic conditions of the DPs in the post-resettlement period;
 9. communication and reactions from DPs on entitlements, compensation, options, alternative developments and relocation timetables etc.;
 10. changes in housing and income levels;
 11. rehabilitation of informal settlers;
 12. valuation of property;
 13. grievance procedures;
 14. disbursement of compensation; and
 15. level of satisfaction of DPs in the post resettlement period.
16. Stages of Monitoring
17. Considering the importance of the various stage of project cycle, the EA will handle the monitoring at each stage as stated below:
18. Preparatory Stage
19. During the pre-relocation phase of resettlement operation, monitoring is concerned with administrative issues such as, establishment of resettlement unit, budget, land acquisition, consultation

with DPs in the preparation of resettlement plan, payments of entitlement due, grievance redresses and so on. The key issue for monitoring will be:

20. Conduct baseline survey
21. Consultations
22. Identification of DP and the numbers
23. Identification of different categories of DPs and their entitlements
24. Collection of gender disaggregated data
25. Inventory and losses survey
26. Asset inventory
27. Entitlements
28. Valuation of different assets
29. Budgeting
30. Information dissemination
31. Institutional arrangements
32. Implementation schedule review, budgets and line items expenditure
33. Relocation Stage
34. Monitoring during the relocation phase covers such issues as site selection in consultation with DPs, development of relocation sites, assistance to DPs (especially to vulnerable groups) in physically moving to the new site. Likewise, aspects such as adjustment of DPs in the new surroundings, attitude of the host population towards the new comers and development of community life are also considered at this stage. The key issue for monitoring will be:
 35. Payment of compensation
 36. Delivery of entitlement
 37. Grievance handling
 38. Preparation of resettlement site, including civic amenities (water, sanitation, drainage, paved streets, electricity)
 39. Consultations
 40. Relocation
 41. Payment of compensation
 42. Livelihood restoration assistance and measures
43. Rehabilitation Stage
44. Once DPs have settled down at the new sites, the focus of monitoring will shift to issues of economic recovery programs including income restoration measures, acceptance of these schemes by DPs, impact of income restoration measures on living standards, and the sustainability of the new livelihood patterns. The key issue for monitoring will be:
 45. Initiation of income generation activities
 46. Provision of basic civic amenities and essential facilities in the relocated area
 47. Consultations
 48. Assistance to enhance livelihood and quality of life
49. Monitoring Indicators

50. The most crucial components/indicators to be monitored are specific contents of the activities and entitlement matrix. The RP contains indicators and benchmarks for achievement of the objectives under the resettlement program. These indicators and benchmarks are of three kinds:

51. Process indicators including project inputs, expenditures, staff deployment, etc.
52. Output indicators indicating results in terms of numbers of affected people compensated and resettled, training held, credit disbursed, etc and
53. Impact indicators related to the longer-term effect of the project on people's lives.

54. Some of the indicative monitoring indicators are as following and a sample land acquisition planning and monitoring form is presented in the **Annexure: 6**.

1. Delivery of Entitlements

55. Entitlements disbursed, compared with number and category of losses set out in the entitlement matrix.
56. Disbursements against timelines.
57. Identification of the displaced persons losing land temporarily, e.g. through soil disposal, borrow pits, contractors' camps, been included.
58. Timely disbursements of the agreed transport costs, relocation costs, income substitution support, and any resettlement allowances, according to schedule.
59. Provision of replacement land plots.
60. Quality of new plots and issue of land titles.
61. Construction of relevant community infrastructure.
62. Restoration of social infrastructure and services.
63. Progress on income and livelihood restoration activities being implemented as set out in the income restoration plan, for example, utilizing replacement land, commencement of production, the number of the displaced persons trained in employment with jobs, microcredit disbursed, number of income-generating activities assisted.
64. Affected businesses receiving entitlements, including transfer and payments for net losses resulting from lost business.

2. Consultation and Grievances

65. Consultations organized as scheduled including meetings, groups, and community activities.
66. Knowledge of entitlements by the displaced persons.
67. Use of the grievance redress mechanism by the displaced persons.
68. Information on the resolution of the grievances.
69. Information on the implementation of the social preparation phase.
70. Implementation of special measures for Indigenous Peoples.

3. Communications and Participation

71. Number of general meetings (for both men and women).
72. Percentage of women out of total participants.
73. Number of meetings exclusively with women.
74. Number of meetings exclusively with vulnerable groups.
75. Number of meetings at new sites.
76. Number of meetings between hosts and the displaced persons.
77. Level of participation in meetings (of women, men, and vulnerable groups).
78. Level of information communicated—adequate or inadequate.
79. Information disclosure.
80. Translation of information disclosure in the local languages.

4. Budget and Time Frame

81. Land acquisition and resettlement staff appointed and mobilized on schedule for the field and office work.
82. Capacity building and training activities completed on schedule.
83. Achieving resettlement implementation activities against the agreed implementation plan.
84. Funds allocation for resettlement-to-resettlement agencies on time.
85. Receipt of scheduled funds by resettlement offices.
86. Funds disbursement according to the resettlement plan.
87. Social preparation phase as per schedule.
88. Land acquisition and occupation in time for implementation.

5. Livelihood and Income Restoration

89. Number of displaced persons under the rehabilitation programs (women, men, and vulnerable groups).
90. Number of displaced persons who received vocational training (women, men, and vulnerable groups).
91. Types of training and number of participants in each.
92. Number and percentage of displaced persons covered under livelihood programs (women, men, and vulnerable groups).
93. Number of displaced persons who have restored their income and livelihood patterns (women, men, and vulnerable groups).
94. Number of new employment activities.
95. Extent of participation in rehabilitation programs.
96. Extent of participation in vocational training programs.
97. Degree of satisfaction with support received for livelihood programs.
98. Percentage of successful enterprises breaking even (women, men, and vulnerable groups).
99. Percentage of displaced persons who improved their income (women, men, and vulnerable groups)

100. Percentage of displaced persons who improved their standard of living (women, men, and vulnerable groups)
101. Number of displaced persons with replacement agriculture land (women, men, and vulnerable groups)
102. Quantity of land owned/contracted by displaced persons (women, men and vulnerable groups)
103. Number. of households with agricultural equipment
104. Number of households with livestock

6. Benefit Monitoring

105. Noticeable changes in patterns of occupation, production, and resource use compared to the pre-project situation.
 106. Noticeable changes in income and expenditure patterns compared to the pre-project situation.
 107. Changes in cost of living compared to the pre-project situation.
 108. Changes in key social and cultural parameters relating to living standards.
 109. Changes occurred for vulnerable groups.
 110. Benefiting from the project by the displaced persons.
111. Reporting Requirements
112. The PIU, responsible for supervision and implementation of the RP will prepare monthly progress reports on resettlement activities and submit semi-annual reports to ADB.
113. The external monitoring expert responsible for monitoring of the RP implementation will submit a semi-annual review report to PIU to determine whether resettlement goals have been achieved, more importantly whether livelihoods and living standards have been restored/ enhanced and suggest suitable recommendations for improvement.
114. All the resettlement monitoring reports will be disclosed to DPs as per procedure followed for disclosure of resettlement documents by the EA. The monitoring reports will also be disclosed on ADB Website.

APPENDIX 1: CENSUS SURVEY QUESTIONNAIRE

Bihar State Highways Project -3 (Phase-2)

Census Questionnaire for PAPs

1. General

A. Road Name: B. Questionnaire No:

C. Name of the Village: D. Name of Block:

E. Name of District: F. Thana No:

G. Plot No: H. Km/Chainage:

2. Ownership of Affected Land

1. Ownership of the Land

1. Private 2. Government 3. Religious 4. Community 5. Others:

2. Type of Land

1. Irrigated 2. Non-Irrigated 3. Barren 4. Forest 5. Residential

6. Commercial 7. Pond 8. Others:

3. Use of Land

1. Cultivation 2. Orchard 3. Residential 4. Commercial 5. Forestation

6. No Use/ Barren 7. Other:

4. Affected area of the Land/Plot (in Acre):

5. Total Area of the affected Land/Plot (in Acre):

6. Total Land Holding of the Affected Person (in Acre)

1. Irrigated: 2. Non-Irrigated:

3. Other: 4. Total:

7. Status of Ownership

1. Titleholder 2. Customary Right 3. License from Local Authority

4. Encroacher 5. Squatter 6. Other (Specify):

8. Type of Private Ownership

1. Individual/Single 2. Joint/Shareholders 3. Other (specify):

9. Name of the Owner/Occupier (s):

10. Father's Name:

11. Rate of the Land (Per Acre)

1. Market Rate: 2. Revenue Rate:

12. Any of the following people associated with the Land

A. Agricultural Laborer 1. Yes 2. No

Name (i) (ii)

B. Tenant/Lessee 1. Yes 2. No

Name (i) (ii)

Sharecropper 1. Yes 2. No

Name (i) (ii)

(Use supplementary sheet for any additional DPs under Question-12)

3. Details of Affected Non-land Assets

13. Any structure in the Affected Land 1. Yes..... 2. No.....
14. Distance of the main structure from centerline of the road (in mtr.).....
15. Distance of boundary wall (if any) from centerline of the road (in mtr.).....
16. Area of the affected structure (in Square Meter)
 a) Length b) Width c) Height
17. Area of the boundary wall only (in Meter): a) Length b) Height
18. Area of the total structure (in Square Meter)
 a) Length b) Width c) Height
19. Scale of Impact on structure
 (a) Up to 25% (b) > 25% and < 50% (c) > 50% and > 75% (d) >75%
20. Type of Construction of the Structure
 1. Temporary (buildings with mud/brick/wood made walls, thatched/tin roof)
 2. Semi-Permanent (buildings, with tiled roof and normal cement floor)
 3. Permanent (with RCC, Single/ Double storey building)
21. Type of Construction of the Boundary Wall *(use code from Question: 20)*
22. Age of the Structure (in years):.....
23. Market Value of the Structure (in Rs.):.....
24. Use of the Structure *(select appropriate code from below)*
- A. Residential Category
 1. House 2. Hut 3. Other (specify):.....
- B. Commercial Category
 4. Shops 5. Hotel 6. Small Eatery 7. Kiosk 8. Farm House
 9. Petrol Pump 10. Clinic 11. STD Booth 12. Workshop 13. Vendors
 14. Com. Complex 15. Industry 16. Pvt. Office 17. Other.....
- C. Mixed Category
 18. Residential-cum-Commercial Structure
- D. Community Type
 19. Community Center 20. Club 21. Trust 22. Memorials 23 Other:.....
- E. Religious Structure
 24. Temple 25. Church 26. Mosque 27. Gurudwara 28. Shrines
 29. Sacred Grove 30. Other.....
- F. Government Structure
 31. Government Office 32. Hospital 33. School 34. College
 35. Bus Stop 36. Other.....
- G. Other Structure
 37. Boundary Wall 38. Foundation 39. Cattle Shed 40. Other:.....
25. Type of Business/Profession by Head of Household:
26. Status of the Structure
 1. Legal Title holder 2. Customary Right 3. License from Local Authority
 4. Encroacher 5. Squatter 6. Other:.....
27. Any of the following people associated with the Structure?
- A. Present in the structure 1. Yes 2. No
- Name (i)..... (ii).....
 (iii)..... (iv).....

B. Employee/ wage earner in commercial structure 1. Yes 2. No

Name (i) (ii)
 (iii) (iv)

C. Employee/ wage earner in residential structure 1. Yes 2. No

Name (i) (ii)

(Use supplementary sheet for any of the DPs under Question-27)

28. Number of trees within the affected area
 1. Fruit Bearing..... 2. Non-fruit Bearing..... 3. Total.....

4. Details of Affected Household

29. Social Category of AP
 1. SC 2. ST 3. OBC 4. General 5. Others.....

30. Religious Category
 1. Hindu 2. Muslim 3. Christian 4. Buddhist 5. Jain 6. Other.....

31. Number of family members Male..... Female..... Total.....

32. Number of family members with following criteria
 1. Unmarried Son/brother > 18 years..... 2. Unmarried Daughter/Sister > 18 years.....
 3. Divorcee/Widow..... 4. Minor Orphan.....

33. Vulnerability Status of the Household:
 1. Woman headed household 2. Headed by elderly / physically disabled person?
 3. Below Poverty Line (BPL) 4. Other:.....

34. Annual income of the family Rs.....

35. If displaced, do you have additional land to shift? 1. Yes 2. No

36. Resettlement/ Relocation Option
 1. Self Relocation 2. Project Assisted Relocation

37. Compensation Option for Land loser
 1. Land for land loss 2. Cash for Land loss

38. Compensation Options for Structure loser
 1. Structure for structure loss 2. Cash for Structure loss

39. Income Restoration Assistance (fill codes in preferred order)
 1. Employment Opportunities in Construction work
 2. Assistance/ Loan from other ongoing development scheme
 3. Vocational Training 4. Other (specify.....)

40. Total number of women above 16 years of age in the family.

41. Are women in the family included in **financial** decision-making 1. Yes 2. No

42. Are women in the family included in **social** decision-making 1. Yes 2. No

43. Do women **exclusively** own any of the following assets?

S.N.	Assets	(1. Yes 2. No)
1	Land (Homestead or Farm Land)	
2	House	
3	Four Wheeler (Car/tractor etc.)	
4	Two Wheeler (Scooter/ Cycle etc.)	
5	Cell Phone	
6	Personal Computer	
7	Any Other.....	

44. Are the women in the family have a separate bank account? 1. Yes 2. No

45. Any women of your family are the member in SHGs? 1. Yes 2. No

46. If yes, will the relocation affect their work? 1. Yes 2. No

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

If yes in Question 47, Please explain.....

47. Do any women members in your family have received any benefit from Government Schemes?

S.N.	Type of Benefit	Name of Scheme	(1. Yes 2. No)
1	Loan		
2	House		
3	Employment		
4	Training		
5	Any Other		

48. Details of Family Members: (fill appropriate code)

Sl. No	Name of the Family Member	Age	Sex	Marital Status	Education	Occupation
		in years	1. Male 2. Female 3. Other	1. Married 2. Unmarried 3. Widow 4. Widower 5. Others	1. Illiterate 2. Literate 3. Up to middle 4. Below middle 5. Mat. 6. Graduate 7. Above Grad. 8. below 6 years	1. Service 2. Business 3. Agriculture 4. Study 5. Retired 6. Labour 7. Unemployed 8. Professional 9. Below 6 years 10. Old/inactive
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Note: Please add a separate sheet if required.

Not to be used as a Bid Document, Only for Reference

Supplementary Sheet1 for Occupiers/Tenant

1. Census Questionnaire/Survey No:.....
2. Name of the Owner:.....
3. Name of the Occupier:.....
4. Father's Name of Occupier:.....
5. Status of Occupier
 - A. Agricultural Laborer B. Agricultural Tenant/Lessee C. Sharecropper
 - D. Tenant in structure E. Employee/ wage earner in Residential/Commercial Structure
6. Social Category of AP
 - 1. SC 2. ST 3. OBC 4. General 5. Others (specify).....
7. Religious Category
 - 1. Hindu 2. Muslim 3. Christian 4. Buddhist
 - 5. Jain 6. Other (specify).....
8. Number of family members Male..... Female..... Total.....
9. Vulnerability Status of the Household:
 - A. Is it a woman headed household? 1. Yes 2. No
 - B. Is it headed by physically/mentally challenged person? 1. Yes 2. No
 - C. Is it a household Below Poverty Line (BPL) 1. Yes 2. No
10. Annual income of the family Rs.
11. Income Restoration Assistance (fill codes in preferred order)
 - 1. Employment Opportunities in Construction work
 - 2. Assistance/ Loan from other ongoing development scheme
 - 3. Vocational Training 4. Others (specify).....
12. Details of Family Members: (fill appropriate code)

S. N.	Name of the Family Member	Age In Years	Sex 1. Male 2. Female 3. Other	Marital Status 1. Married 2. Unmarried 3. Widow 4. Widower 5. Others	Education 1. Illiterate 2. Literate Up to middle 4. Below metric 5. Metric 6. Graduate 7. Above Grad. 8. Below 6 year	Occupation 1. Service 2. Business 3. Agriculture 4. Study 5. Housewife 6. Labour 7. Unemployed 8. Professional 9. Below 6 years 10. Old/ inactive 11. Others
1						
2						
3						
4						
5						
6						
7						

Add more sheets as applicable

APPENDIX 2: LIST OF DISPLACED PERSONS (LAND TITLEHOLDERS)

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
1	Khirnia	Chautham	7+400-7+500	0.0523	Non-Significant	Phulay Devi (Umesh Thakur)					BPL
2	Khirnia	Chautham	7+400-7+500	0.3161	Significant	Md Jamil					
3	Khirnia	Chautham	7+400-7+500	0.0500	Non-Significant	Rita Devi (Shankar Thakur)					BPL
4	Khirnia	Chautham	7+500-7+600	0.0436	Non-Significant	Phulchand Chaudhary					
5	Khirnia	Chautham	7+500-7+500	0.0981	Significant	Rajendra Chaudhary (Chandan Devi)					BPL
6	Khirnia	Chautham	7+500-7+600	0.3764	Significant	Sabnam Khatun					BPL
7	Khirnia	Chautham	7+500-7+600	0.2068	Non-Significant	Subhash Thakur					BPL
8	Khirnia	Chautham	7+500-7+600	0.1355	Significant	Jogindra Thakur					BPL
9	Khirnia	Chautham	7+500-7+600	0.2074	Significant	Maheshwar Mistri (Amit Kumar)					BPL
10	Khirnia	Chautham	7+550-7+600	0.3531	Significant	Lalan Mistri					BPL
11	Khirnia	Chautham	7+550-7+600	0.3761	Significant	Shanti Devi					BPL
12	Khirnia	Chautham	7+550-7+600	0.5056	Non-Significant	Rajiv Ranjan Kumar					
13	Khirnia	Chautham	7+600-7+650	0.8785	Non-Significant	Md Taki (Md Israt)					
14	Khirnia	Chautham	7+650-7+700	0.1813	Significant	Laddu Thakur					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
15	Hardiya	Chautham	8+000-8+050	0.7748	Significant	Sanjay Yadav (Himansu Kumar)					BPL
16	Hardiya	Chautham	8+000-8+050	0.4847	Significant	Bindeshary Yadav					
17	Hardiya	Chautham	8+050-8+100	0.0158	Non-Significant	Sulekha Devi					BPL
18	Hardiya	Chautham	8+050-8+100	0.0158	Non-Significant	Mukhi Lal Singh					BPL
19	Hardiya (Purani Hardiya)	Chautham	8+050-8+100	0.0158	Non-Significant	Balweshar Sah					
20	Hardiya (Purani Hardiya)	Chautham	8+100-8+150	0.7845	Significant	Pramod Kumar Chaudhary					BPL
21	Hardiya (Purani Hardiya)	Chautham	8+150-8+200	0.0634	Non-Significant	Krishna Dev Yadav (Rajniti Kumar)					BPL
22	Hardiya	Chautham	8+150-8+200	0.6827	Significant	Hareram Singh					
23	Hardiya	Chautham	8+150-8+200	0.2331	Significant	Indradev Paswan					SC
24	Hardiya	Chautham	8+150-8+200	0.4340	Non-Significant	Gopal Singh					
25	Hardiya	Chautham	8+150-8+200	0.8838	Significant	Ram Balik Singh					
26	Hardiya	Chautham	8+200-8+250	0.4348	Non-Significant	Bathuaa Devi					
27	Hardiya	Chautham	8+300-8+400	0.1614	Non-Significant	Jay Jay Ram Chaudhary					
28	Hardiya	Chautham	8+300-8+400	0.1615	Significant	Kamal Kishor Chaudhary					
29	Hardiya	Chautham	8+400-8+500	0.3793	Significant	Dev Narayan Bhagat					BPL
30	Hardiya	Chautham	8+400-8+500	0.3793	Significant	Sinkandar Bhagat					BPL
31	Hardiya	Chautham	8+400-8+500	0.3795	Significant	Kamli Yadav					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
32	Hardiya	Chautham	8+400-8+500	0.5664	Significant	Janardan Yadav					
33	Hardiya (Purani Hardiya)	Chautham	8+450-8+500	0.2545	Non-Significant	Ranjit Yadav					
34	Hardiya	Chautham	8+500-8+600	0.0244	Non-Significant	Banarsi Paswan					SC
35	Hardiya	Chautham	8+500-8+600	0.5156	Non-Significant	Subhash Cahudhary					
36	Dighari	Chautham	8+600-8+650	0.3860	Significant	Manish Kumar					p
37	Dighari	Chautham	8+600-8+650	0.4870	Non-Significant	Pravendra Kumar (Chakradhar Gopal)					BPL
38	Dighari	Chautham	8+800-8+900	0.4369	Non-Significant	Jitendra Mandal					
39	Dighari	Chautham	8+850-8+900	0.0003	Non-Significant	Subdhi Devi					SC
40	Dighari	Chautham	8+800-8+900	0.5697	Non-Significant	Kumar Shambhu Singh					
41	Dighari	Chautham	8+900-8+950	0.0502	Non-Significant	Moji Sada					SC
42	Dighari	Chautham	8+900-8+950	1.6323	Significant	Surendra Chaudhary					BPL
43	Dighari	Chautham	8+900-8+950	0.4729	Significant	Chandar Sada					SC
44	Dighari	Chautham	9+100-9+150	0.4850	Significant	Raj Kishor Yadav					BPL
45	Dighari	Chautham	9+100-9+150	0.7833	Significant	Kamtlal Yadav					BPL
46	Dighari	Chautham	9+150-9+200	0.0061	Non-Significant	Sukram Sada					SC
47	Dighari	Chautham	9+150-9+200	1.2278	Significant	Shyam Lal Mandal					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
48	Dighari	Chautham	9+300-9+350	0.2961	Significant	Satrogan Yadav					BPL
49	Dighari	Chautham	9+300-9+350	0.2961	Significant	Siya Saran Yadav					
50	Dighari	Chautham	9+300-9+350	0.2961	Significant	Pinki Kumari					
51	Dighari	Chautham	9+300-9+350	0.2966	Significant	Niranjan Kumar					
52	Dighari	Chautham	9+400-9+450	0.2961	Significant	Mantu Yadav					
53	Dighari	Chautham	9+400-9+450	0.1373	Non-Significant	Bhujagi Yadav					BPL
54	Dighari	Chautham	9+500-9+550	0.1588	Significant	Anita Devi					BPL
55	Dighari	Chautham	9+500-9+550	0.1588	Significant	Sugandha Devi					BPL
56	Dighari	Chautham	9+500-9+550	0.4317	Significant	Ram Bachan Yadav					BPL
57	Dighari	Chautham	9+550-9+600	0.2727	Significant	Viraj Yadav					BPL
58	Dighari	Chautham	9+800-9+850	1.0734	Significant	Ramvinay Paswan					SC
59	Dighari	Chautham	9+000-9+950	0.4453	Significant	Wakil Singh					BPL
60	Dighari	Chautham	9+000-9+950	1.5189	Significant	Narayan Singh					
61	Dighari (Bangalia)	Chautham	9+000-9+950	0.3671	Significant	Samtola Devi (Anjesh Singh)	18 +4.5 BW	75-100	Semi Perma	House	BPL
62	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Turani Singh	40.95	75-100	Temp	House	BPL
63	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Tuntun Ram					SC
64	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Rukmani Devi					SC

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
65	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Chandra Kala Devi					SC
66	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Significant	Pinki Devi					BPL
67	Dighari (Bangalia)	Chautham	9+950-10+000	0.1686	Significant	Baleshwar Singh (Naresh)					BPL
68	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Shobha Singh	35	75-100	Temp	House	BPL
69	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Tuntun Sharma					BPL
70	Dighari (Bangalia)	Chautham	9+950-10+000	0.0326	Non-Significant	Inzula Devi					BPL
71	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Significant	Baba Ji Singh	24.6	75-100	Permanent	House	BPL
72	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Non-Significant	Sanjay Kumar Bharti					
73	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Significant	Lalo Singh					
74	Dighari (Bangalia)	Chautham	9+950-10+000	0.1564	Significant	Dinesh Singh					BPL
75	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Significant	Chandeshwari Yadav	72.5	75-100	Permanent	House	BPL
76	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Non-Significant	Raj Kumar Yadav	65.36 + 7.0 BW	75-100	Permanent	House	BPL
77	Dighari (Bangalia)	Chautham	9+950-10+000	0.0782	Non-Significant	Shankar Yadav	129	75-100	Permanent	House	BPL
78	Dighari (Bangalia)	Chautham	9+950-10+000	0.4463	Significant	Ram Lakhan Singh					BPL
79	Dighari (Bangalia)	Chautham	10+000-10+050	0.0782	Significant	Pramod Pathak/Raj Kumar Pathak					BPL
80	Dighari (Bangalia)	Chautham	10+000-10+050	0.0782	Significant	Prakash Paswan					SC
81	Dighari (Bangalia)	Chautham	10+000-10+050	0.0783	Significant	Vijay Kumar Yadav					

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
82	Dighari (Bangalia)	Chautham	10+150-10+200	0.2180	Significant	Mato Singh	2.25	50-75	Semi Perma	Toilet	BPL
83	Dighari (Bangalia)	Chautham	10+150-10+200	0.1744	Significant	Hardev Singh	42	75-100	Permanent	House	
84	Dighari (Bangalia)	Chautham	10+150-10+200	0.3010	Significant	Indra Dev Singh	18.24+13.0 BW	75-100	Permanent	House	BPL
85	Dighari (Bangalia)	Chautham	10+150-10+200	0.7731	Significant	Bahuajn Singh					BPL
86	Dighari (Bangalia)	Chautham	10+200-10+300	0.3861	Non-Significant	Ramchandra Singh	50.73	75-100	Permanent	House	BPL
87	Dighari (Bangalia)	Chautham	10+300-10+350	0.092	Non-Significant	Ram Vilash Singh					
88	Dighari (Bangalia)	Chautham	10+350-10+400	0.2180	Non-Significant	Chandradev Singh	34.72	75-100	Permanent	House	
89	Dighari (Bangalia)	Chautham	10+350-10+400	0.3190	Significant	Tara Devi					
90	Dighari (Bangalia)	Chautham	10+350-10+400	0.4885	Significant	Ashok Singh	57.4	75-100	Semi Perma	Under Cons	BPL
91	Dighari (Bangalia)	Chautham	10+350-10+400	0.1744	Significant	Janardhan Singh					BPL
92	Dighari (Bangalia)	Chautham	10+350-10+400	0.0900	Significant	Jagdambi Singh					WHH
93	Dighari (Bangalia)	Chautham	10+350-10+400	0.0872	Significant	Upendra Singh	3.6	75-100	Semi Perma	Toilet	BPL
94	Dighari (Bangalia)	Chautham	10+350-10+400	0.2595	Significant	Anup Lal Singh					BPL
95	Dighari (Bangalia)	Chautham	10+350-10+400	0.2595	Non-Significant	Laldhan Devi					
96	Dighari (Bangalia)	Chautham	10+400-10+450	0.0872	Significant	Meena Devi (Bandhan)	6	75-100	Temp	Toilet	BPL
97	Dighari (Bangalia)	Chautham	10+400-10+450	0.4318	Significant	Ramchandra Singh					
98	Dighari (Bangalia)	Chautham	10+400-10+450	0.3903	Non-Significant	Rajesh Kumar Yadav					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
99	Dighari (Bangalia)	Chautham	10+400-10+450	0.2595	Significant	Sudin Singh					BPL
100	Dighari (Bangalia)	Chautham	10+400-10+450	0.2000	Significant	Rampukar Singh					
101	Dighari (Bangalia)	Chautham	10+400-10+450	0.2000	Significant	Vinod Singh	53.04	75-100	Semi Perma	Under Cons	
102	Dighari (Bangalia)	Chautham	10+500-10+550	0.2595	Non-Significant	Umesh Sigh	82.8	75-100	Semi Perma	Under Cons	BPL
103	Dighari (Bangalia)	Chautham	10+650-10+700	0.5519	Significant	Sunil Kumar					
104	Dighari (Bangalia)	Chautham	10+500-10+550	0.2595	Non-Significant	Rampal Singh	146.52	75-100	Permanent	House	BPL
105	Dhamahara	Chautham	10+700-10+800	0.4498	Significant	Chandra Sekhar Singh					
106	Dhamahara	Chautham	10+800-10+850	0.4498	Significant	Sudha Devi					
107	Dhamahara	Chautham	10+800-10+850	0.4498	Significant	Chandra Bhushan Singh					
108	Dhamahara	Chautham	10+800-10+850	0.4498	Significant	Manju Devi					BPL
109	Dhamahara	Chautham	10+800-10+850	0.4498	Significant	Chhatrdhari Singh					BPL
110	Dhamahara	Chautham	10+800-10+850	1.0219	Significant	Dinesh Singh					BPL
111	Dhamahara	Chautham	10+900-10+950	0.6221	Significant	Gauri Bhagat (Mithlesh Bhagat)					BPL
112	Dhamahara	Chautham	10+900-10+950	0.16	Significant	Kavita Devi					
113	Dhamahara	Chautham	10+950-11+000	0.05	Significant	Renu Devi					BPL
114	Dhamahara	Chautham	10+950-11+000	0.8796	Significant	Jay Prakash Singh					
115	Dhamahara	Chautham	10+950-11+000	0.02	Significant	Vina Devi					

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
116	Dhamahara	Chautham	10+950-11+000	0.11	Significant	Rekha Devi					BPL
117	Dhamahara	Chautham	11+100-11+150	0.7896	Significant	Kabita Devi					BPL
118	Dhamahara	Chautham	11+300-11+350	0.7123	Significant	Ram Sugarath Singh					
119	Dhamahara	Chautham	11+400-11+450	0.8796	Significant	Ram Pravesh Kumar	53.6	75-100	Semi Perma	House	
120	Dhamahara	Chautham	11+400-11+450	1.3544	Significant	Bauna Ram	58.4	75-100	Semi Perma	House	SC
121	Dhamahara	Chautham	11+400-11+450	0.5723	Significant	Darbeshawer Singh					BPL
122	Dhamahara	Chautham	11+400-11+450	0.16	Significant	Chandra Kishore Mistri	35.75	75-100	Semi Perma	House	
123	Dhamahara	Chautham	11+450-11+500	0.04	Significant	Rubi Devi	22.5	75-100	Temp	House	BPL
124	Dhamahara	Chautham	11+550-11+600	0.16	Significant	Sakindra Paswan					SC
125	Dhamahara	Chautham	11+550-11+600	0.086	Non-Significant	Sakal Dev Singh					BPL
126	Dhamahara	Chautham	11+600-11+650	0.1723	Non-Significant	Ram Sarup Singh					BPL
127	Dhamahara	Chautham	11+600-11+650	0.1723	Non-Significant	Bal Govind Sah					
128	Dhamahara	Chautham	11+600-11+650	0.08	Non-Significant	Surya Narayan Sharma					BPL
129	Dhamahara	Chautham	11+600-11+650	0.2574	Significant	Vishun Dev Singh	54.6	75-100	Semi Perma	House	BPL
130	Dhamahara	Chautham	11+650-11+700	0.08	Significant	Ranjit Kumar					BPL
131	Dhamahara	Chautham	11+650-11+700	0.045	Non-Significant	Surya Sharma					
132	Dhamahara	Chautham	11+650-11+700	0.2315	Non-Significant	Sakal Dev Singh	36	75-100	Temp	Hut	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
133	Dhamahara	Chautham	11+700-11+750	0.085	Non-Significant	Phekan Sharma					BPL
134	Dhamahara	Chautham	11+700-11+750	0.1	Significant	Sita Devi (Jyotish Kumar)					
135	Dhamahara	Chautham	11+700-11+750	0.3569	Significant	Dashrath Thakur (Pawan Thakur)					
136	Dhamahara	Chautham	11+700-11+750	0.1723	Significant	Bhuto Singh					BPL
137	Dhamahara	Chautham	11+750-11+800	0.08	Non-Significant	Prakash Sharma					BPL
138	Dhamahara	Chautham	11+750-11+800	0.3437	Significant	Dayanand Sah					BPL
139	Dhamahara	Chautham	11+750-11+800	0.1723	Significant	Aacho Ram					SC
140	Dhamahara	Chautham	11+750-11+800	0.3046	Significant	Chanar Dev Singh					
141	Dhamahara	Chautham	11+750-11+800	0.12	Non-Significant	Tapendra Singh					BPL
142	Dhamahara	Chautham	11+800-11+850	0.013	Non-Significant	Surendra Singh					BPL
143	Dhamahara (New Banglia)	Chautham	12+250-12+300	0.837	Significant	Siudha Devi					BPL
144	Dhamahara (New Banglia)	Chautham	12+250-12+300	0.837	Significant	Manish Kumar					BPL
145	Dhamahara (New Banglia)	Chautham	12+250-12+300	0.8371	Non-Significant	Ahsok Yadav	45.58	75-100	Semi Perma	House	
146	Dhamahara (New Banglia)	Chautham	12+250-12+300	0.3982	Significant	Ram Balak Yadav					WHH
147	Dhamahara (New Banglia)	Chautham	12+300-12+350	0.2588	Non-Significant	Wakil Yadav	42	75-100	Temp	Hut	BPL
148	Dhamahara (New Bangli)	Chautham	12+300-12+350	0.2587	Non-Significant	Digambar Yadav	25.16	75-100	Semi Perma	House	
149	Dhamahara	Chautham	12+300-12+350	2.0452	Significant	Jawahar Yadav	85.4	75-100	Semi Perma	House	

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
150	Dhamahara	Chautham	12+500-12+550	0.4181	Non-Significant	Vimla Devi					BPL
151	Dhamahara	Chautham	12+550-12+600	0.418	Non-Significant	Sahadev Singh					BPL
152	Dhamahara	Chautham	12+600-12+650	0.431	Non-Significant	Shanti Deivi					
153	Dhamahara (Shrinagar)	Chautham	12+700-12+750	0.2168	Significant	Bebi Devi					BPL
154	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.2168	Non-Significant	Maya Ram Yadav					BPL
155	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.2168	Significant	Gana Devi					BPL
156	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.2168	Significant	Jay Hindra Yadav, RavindraYad					
157	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.2168	Significant	Ravindra Yadav					
158	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.3536	Non-Significant	Arvind Yadav					BPL
159	Dhamahara (Shrinagar)	Chautham	12+800-12+850	0.3536	Non-Significant	Hgohal Yadav					BPL
160	Dhamahara (Shrinagar)	Chautham	12+900-12+950	0.2875	Significant	Benchu Yadav					BPL
161	Dhamahara (Shrinagar)	Chautham	12+900-12+950	0.12	Significant	Jageswar Sada	22	75-100	Temp	Hut	SC
162	Dhamahara (Shrinagar)	Chautham	12+950-13+000	0.2168	Significant	Bidesh Sada	37.8	75-100	Temp	House	SC
163	Dhamahara (Shrinagar)	Chautham	12+950-13+000	0.14	Significant	Pukar Sada	31.62	75-100	Temp	House	SC
164	Dhamahara	Chautham	12+950-13+000	0.048	Significant	Mukesh Sada	36.72	75-100	Temp	House	SC
165	Dhamahara	Chautham	12+950-13+000	0.16	Significant	Chadan Sada	22	75-100	Temp	Hut	SC
166	Dhamahara	Chautham	12+950-13+000	0.044	Significant	Mukesh Kumar	35.34	75-100	Temp	House	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
167	Dhamahara	Chautham	12+950-13+000	0.044	Significant	Sanjay Sharma	32	75-100	Temp	House	BPL
168	Dhamahara	Chautham	12+950-13+000	0.3936	Non-Significant	Manoj Kumar Singh					
169	Dhamahara	Chautham	13+000-13+050	0.3536	Significant	Badri Sada	27	75-100	Temp	House	SC
170	Dhamahara	Chautham	13+050-13+100	0.964	Significant	Bhola Mandal					BPL
171	Dhamahara	Chautham	13+100-13+150	0.772	Significant	Ranjan Yadav					WHH
172	Dhamahara	Chautham	13+050-13+100	0.0212	Non-Significant	Mago Sah					BPL
173	Dhamahara	Chautham	13+100-13+150	0.2168	Significant	Suresh Sah	36.75	75-100	Temp	House	BPL
174	Dhamahara	Chautham	13+100-13+150	0.02	Non-Significant	Inderdev Mandal					BPL
175	Dhamahara	Chautham	13+100-13+150	0.04	Non-Significant	Sakaldev Mandal					BPL
176	Dhamahara	Chautham	13+100-13+150	0.02	Non-Significant	Gudiya Devi					BPL
177	Dhamahara	Chautham	13+100-13+150	0.0068	Non-Significant	Anandi Das					SC
178	Dhamahara	Chautham	13+150-13+200	0.04	Significant	Lalita Devi					SC
179	Dhamahara	Chautham	13+150-13+200	0.04	Non-Significant	Lalita Devi	8.68	75-100	Temp	House	BPL
180	Dhamahara	Chautham	13+150-13+200	0.08	Non-Significant	Bechan Sah	52.89	75-100	Temp	House	PHH
181	Dhamahara	Chautham	13+150-13+200	0.08	Non-Significant	Putul Devi					BPL
182	Dhamahara	Chautham	13+150-13+200	0.788	Significant	Bharat Sah					BPL
183	Dhamahara	Chautham	13+200-13+250	0.1728	Significant	Sanjay Yadav					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
184	Dhamahara	Chautham	13+200-13+250	0.4529	Significant	Dilo Sah					BPL
185	Dhamahara	Chautham	13+200-13+250	0.453	Significant	Jay Narayan Sah	19.2	75-100	Temp	House	BPL
186	Dhamahara	Chautham	13+250-13+300	0.1726	Significant	Ghuran Chaudhary					BPL
187	Dhamahara	Chautham	13+250-13+300	0.0006	Non-Significant	Viveka Nand Yadav					
188	Dhamahara	Chautham	13+250-13+300	0.0005	Non-Significant	Deelip Singh					BPL
189	Dhamahara	Chautham	13+250-13+300	0.1726	Non-Significant	Vinay Kumar Singh					WHL
190	Buchcha (Dhanchhar)	Chautham	13+700-13+750	0.1265	Significant	Suresh Singh					BPL
191	Buchcha (Dhanchhar)	Chautham	13+700-13+750	0.5868	Significant	Sanjay Kumar Singh					BPL
192	Buchcha (Dhanchhar)	Chautham	13+700-13+750	0.2	Significant	Jay Kumar Singh					BPL
193	Buchcha (Dhanchhar)	Chautham	13+750-13+800	0.2579	Significant	Murti Devi					BPL
194	Buchcha (Dhanchhar)	Chautham	13+750-13+800	0.16	Non-Significant	Sukama Devi					BPL
195	Buchcha (Dhanchhar)	Chautham	13+750-13+800	0.1347	Non-Significant	Saryug Singh					
196	Buchcha (Dhanchhar)	Chautham	13+750-13+800	0.1321	Significant	Shabo Devi					BPL
197	Buchcha (Dhanchhar)	Chautham	13+800-13+850	0.1790	Non-Significant	Ram Ji Singh					
198	Buchcha (Dhanchhar)	Chautham	13+800-13+850	0.219	Significant	Anil Kumar					BPL
199	Buchcha (Dhanchhar)	Chautham	13+850-13+900	0.1308	Significant	Upendra Sigh	18.4	75-100	Semi Perma	House	
200	Buchcha (Dhanchhar)	Chautham	13+850-13+900	0.1308	Significant	Sambhu Singh	4.48	75-100	Temp	Toilet	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
201	Buchcha (Dhanchhar)	Chautham	13+850-13+900	0.1790	Significant	Nibha Devi	33.6	75-100	Temp	Hut	BPL
202	Buchcha (Dhanchhar)	Chautham	13+850-13+900	0.2757	Non-Significant	Ram Lakhan Singh	6.76	75-100	Permanent	Toilet	
203	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.1393	Significant	Mahadev Singh					BPL
204	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.0393	Non-Significant	Phul Kumari					BPL
205	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.1492	Significant	Jay Kishor Singh					
206	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.1492	Significant	Umesh Singh					BPL
207	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.01	Non-Significant	Manoj Kumar Singh	27.2	75-100	Permanent	Resi+Com	BPL
208	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.03	Non-Significant	Jay Kishor Singh					BPL
209	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.02	Non-Significant	Ganesh Singh					BPL
210	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.02	Non-Significant	Phulesar Singh					BPL
211	Buchcha (Dhanchhar)	Chautham	13+900-13+950	0.1504	Non-Significant	Urmila Devi					BPL
212	Buchcha (Dhanchhar)	Chautham	13+950-14+000	0.1099	Significant	Mira Devi					BPL
213	Buchcha (Dhanchhar)	Chautham	13+950-14+000	0.2897	Significant	Gunna Devi					BPL
214	Buchcha (Dhanchhar)	Chautham	13+950-14+000	0.2897	Significant	Sulekha Devi	26.22	75-100	Temp	House	BPL
215	Buchcha (Dhanchhar)	Chautham	13+950-14+000	0.08	Significant	Gajendra Kumar Sahu	31.11	75-100	Temp	House	BPL
216	Buchcha (Dhanchhar)	Chautham	14+000-14+100	0.1897	Significant	Girja Devi	47.5	75-100	Temp	House	BPL
217	Buchcha (Dhanchhar)	Chautham	14+050-14+100	0.1398	Significant	Ramdana Devi	17.22	75-100	Temp	Hut	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
218	Buchcha (Dhanchhar)	Chautham	14+050-14+100	0.1259	Significant	Sekha Devi					BPL
219	Buchcha (Dhanchhar)	Chautham	14+100-14+150	0.1259	Significant	Nilam Devi					BPL
220	Buchcha (Dhanchhar)	Chautham	14+100-14+150	0.1259	Significant	Kishore Sah	54	75-100	Temp	Resi+Com	BPL
221	Buchcha (Dhanchhar)	Chautham	14+100-14+150	0.1259	Significant	Singesar Sah					
222	Buchcha (Dhanchhar)	Chautham	14+150-14+200	0.254	Significant	Pramod Singh	66.5	75-100	Temp	Resi+Com	
223	Buchcha (Dhanchhar)	Chautham	14+150-14+200	0.2513	Non-Significant	Vinodi Singh	7.4 BW	75-100		Boundary Wall	BPL
224	Buchcha (Dhanchhar)	Chautham	14+200-14+250	0.2513	Non-Significant	Pinku Singh					
225	Buchcha (Dhanchhar)	Chautham	14+200-14+250	0.1259	Significant	Chandra Kala Devi					
226	Buchcha (Dhanchhar)	Chautham	14+200-14+250	0.2513	Non-Significant	Pankaj Singh					
227	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1286	Non-Significant	Sanjay Singh					BPL
228	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1286	Significant	Maya Ram Singh					BPL
229	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Significant	Upendra Sah					BPL
230	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Significant	Mani Lal Sah					BPL
231	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Significant	Kapil Dev Singh					BPL
232	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Non-Significant	Jagar Nath Chaudhary					
233	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Non-Significant	Bilash Chaudhary					BPL
234	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Non-Significant	Umesh Chaudhary					BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometer	Affected Area (in Acre)	Scale of Impact (%)	Name of the Owner	Area Affected Structure (sq.m)	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Vulnerability
235	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1259	Significant	Sakal Dev Singh					BPL
236	Buchcha (Dhanchhar)	Chautham	14+250-14+300	0.1279	Significant	Sita Ram Prasad Singh					BPL
237	Buchcha (Dhanchhar)	Chautham	14+300-14+350	0.1259	Non-Significant	Keshar Alam					BPL
238	Buchcha (Dhanchhar)	Chautham	14+350-14+400	0.2541	Significant	Maya Devi	36.12	75-100	Semi Perma	Under Cons	BPL
239	Buchcha (Dhanchhar)	Chautham	14+350-14+400	0.1708	Significant	Bhoal Chaudhary					BPL
240	Buchcha (Dhanchhar)	Chautham	14+400-14+500	0.0027	Non-Significant	Ram Pravesh Singh					BPL
241	Buchcha (Dhanchhar)	Chautham	14+400-14+500	0.0027	Non-Significant	Chun Chun Singh					BPL
242	Buchcha (Dhanchhar)	Chautham	14+400-14+500	0.0027	Non-Significant	Dechan Devi					BPL

LIST OF DISPLACED PERSONS (NON-TITLEHOLDERS AND TH HAVING MULTIPLE PROPERTY)

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
1	Mansi (Khutia)	Mansi	0+300-0+400	Ashok Sah	75-100	Temp	Shop	Squatter	NTH
2	Mansi (Khutia)	Mansi	0+300-0+400	Arun Yadav	75-100	Temp	Small Eatery	Squatter	BPL
3	Mansi (Khutia)	Mansi	0+300-0+400	Shankar Rajak	75-100	Temp	Cattleshed	Squatter	SC
4	Mansi (Khutia)	Mansi	0+300-0+400	Ram Ji Rajak	75-100	Temp	Cattleshed	Squatter	BPL
5	Mansi (Khutia)	Mansi	0+400-0+500	Manoj Choudhary	75-100	Temp	Shop	Squatter	SC
6	Mansi (Khutia)	Mansi	0+400-0+500	Pawan Choudhary	75-100	Temp	Shop	Squatter	SC
7	Mansi (Khutia)	Mansi	0+400-0+500	Rajesh Choudhary	75-100	Temp	Shop	Squatter	SC
8	Mansi (Khutia)	Mansi	0+400-0+500	Hajo Kumar	75-100	Temp	Shop	Squatter	SC
9	Mansi (Khutia)	Mansi	0+400-0+500	Kanhaiya Choudhary	75-100	Temp	Kiosk	Squatter	BPL
10	Mansi (Khutia)	Mansi	0+400-0+500	Kanhaiya Choudhary	75-100	Temp	Shop	Squatter	
11	Mansi (Khutia)	Mansi	0+400-0+500	Munna Choudhary	75-100	Temp	Shop	Squatter	SC
12	Mansi (Khutia)	Mansi	0+400-0+500	Ramvilash Sah	75-100	Temp	Shop	Squatter	BPL
13	Mansi (Khutia)	Mansi	0+400-0+500	Daya Ram Sah	50-75	Temp	Shop	Squatter	BPL
14	Mansi (Khutia)	Mansi	0+400-0+500	Santosh Sah	50-75	Temp	Shop	Encroacher	BPL
15	Mansi (Chak Husaini)	Mansi	0+500-0+600	Manoj Yadav	0-25	Semi Perma	Shop	Encroacher	BPL
16	Mansi (Chak Husaini)	Mansi	0+500-0+600	Manoj Yadav	25-50	Semi Perma	Shop	Encroacher	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
17	Mansi (Chak Husaini)	Mansi	0+500-0+600	Sawitri Devi	25-50	Semi Perma	Shop	Encroacher	BPL
18	Mansi (Chak Husaini)	Mansi	0+500-0+600	Md Manjur Alam	75-100	Temp	Kiosk	Squatter	BPL
19	Mansi (Chak Husaini)	Mansi	0+500-0+600	Bijendra Yadav	25-50	Semi Perma	Shop	Encroacher	BPL
20	Mansi (Chak Husaini)	Mansi	0+500-0+600	Rajesh Kumar	0-25	Semi Perma	Shop	Encroacher	BPL
21	Mansi (Chak Husaini)	Mansi	0+500-0+600	Shankar Yadav	0-25	Semi Perma	Shop	Encroacher	
22	Mansi (Chak Husaini)	Mansi	0+500-0+600	Naresh Yadav	75-100	Temp	Kiosk	Squatter	NTH
23	Mansi (Chak Husaini)	Mansi	0+500-0+600	Sada Shiv Prasad	25-50	Temp	Shop	Encroacher	
24	Mansi (Chak Husaini)	Mansi	0+600-0+700	Sada Shiv Prasad	25-50	Temp	Shop	Squatter	
25	Mansi (Chak Husaini)	Mansi	0+500-0+600	Alok Anand	50-75	Temp	Shop	Squatter	NTH
26	Mansi (Chak Husaini)	Mansi	0+500-0+600	Alok Anand	75-100	Temp	Shop	Squatter	
27	Mansi (Chak Husaini)	Mansi	0+500-0+600	Alok Anand	50-75	Semi Perma	Shop	Squatter	
28	Mansi (Chak Husaini)	Mansi	0+500-0+600	Manish Kumar	75-100	Temp	Kiosk	Squatter	NTH
29	Mansi (Chak Husaini)	Mansi	0+500-0+600	Dinesh Kumar	25-50	Semi Perma	Shop	Squatter	BPL
30	Mansi (Chak Husaini)	Mansi	0+600-6+700	Santosh Kumar Singh	75-100	Semi Perma	Shop	Squatter	
31	Mansi (Chak Husaini)	Mansi	0+600-6+700	Devid Kumar	0-25	Temp	Shop	Squatter	NTH
32	Mansi (Chak Husaini)	Mansi	0+600-6+700	Sanjiv Kumar	25-50	Temp	Shop	Encroacher	BPL
33	Mansi (Chak Husaini)	Mansi	0+600-6+700	Gopal Singh	75-100	Semi Perma	Boundary Wall	Squatter	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
34	Mansi (Chak Husaini)	Mansi	0+600-6+700	Ranjit Kumar	50-75	Temp	Shop	Squatter	NTH
35	Mansi (Chak Husaini)	Mansi	0+800-0+900	Mithlesh Sah	25-50	Temp	Shop	Squatter	BPL
36	Mansi (Chak Husaini)	Mansi	0+800-0+900	Vijay Kumar Sah	0-25	Temp	Shop	Squatter	NTH
37	Mansi (Chak Husaini)	Mansi	1+300-1+000	Sunil Kumar	50-75	Temp	Kiosk	Squatter	BPL
38	Mansi (Chak Husaini)	Mansi	0+900-1+000	Abhishek Kumar	25-50	Temp	Small Eatery	Squatter	NTH
39	Mansi (Chak Husaini)	Mansi	1+100-1+200	Parmod Pandit	50-75	Temp	Kiosk	Squatter	
40	Mansi (Chak Husaini)	Mansi	1+200-1+300	Gita Devi	50-75	Temp	Resi+Com	Squatter	WHH
41	Mansi (Chak Husaini)	Mansi	1+200-1+300	Pankaj Mallick	75-100	Temp	House	Squatter	SC
42	Mansi (Chak Husaini)	Mansi	1+300-1+400	Anita Devi	75-100	Temp	House	Squatter	SC
43	Mansi (Chak Husaini)	Mansi	1+300-1+400	Naresh Mallick	25-50	Permanent	House	Squatter	SC
44	Mansi (Chak Husaini)	Mansi	1+300-1+400	Wakil Mallick	25-50	Semi Perma	House	Squatter	SC
45	Mansi (Chak Husaini)	Mansi	1+300-1+400	Gopal Singh	50-75	Temp	Small Eatery	Squatter	NTH
46	Mansi (Chak Husaini)	Mansi	1+500-1+600	Munna Singh	0-25	Semi Perma	Shop	Encroacher	BPL
47	Mansi (Chak Husaini)	Mansi	1+800-1+900	Tufan Singh	50-75	Temp	Hut	Squatter	BPL
48	Balha	Mansi	5+000-5+100	Upendra Mahto	75-100	Temp	Kiosk	Squatter	BPL
49	Balha	Mansi	5+200-5+300	Kishor Sada	25-50	Temp	Hut	Squatter	SC
50	Balha	Mansi	5+400-5+500	Pawan Sharma	75-100	Temp	Kiosk	Squatter	WHH

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
51	Balha	Mansi	5+500-5+600	Niranjan Yadav	50-75	Temp	Hut	Squatter	BPL
52	Balha	Mansi	5+500-5+600	Dayanand Yadav	50-75	Temp	Hut	Squatter	NTH
53	Balha	Mansi	5+700-5+800	Ram Bahadur Sharma	50-75	Temp	Shop	Squatter	
54	Balha	Mansi	5+000-6+100	Diwakar Kumar	0-25	Semi Perma	Cattleshed	Encroacher	BPL
55	Balha	Mansi	6+000-6+100	Vijay Kumar	75-100	Temp	Kiosk	Squatter	BPL
56	Balha	Mansi	6+100-6+200	Dukha Ram	50-75	Temp	House	Encroacher	SC
57	Balha	Mansi	6+100-6+200	Ashok Kumar	75-100	Semi Perma	Shop	Encroacher	SC
58	Balha	Mansi	6+100-6+200	Subodh Ram	75-100	Semi Perma	Boundary Wall	Squatter	SC
59	Balha	Mansi	6+100-6+200	Santosh Ram	75-100	Temp	Shop	Squatter	SC
60	Balha	Mansi	6+200-6+300	Rinku Kumar	75-100	Semi Perma	Toilet	Squatter	SC
61	Balha	Mansi	6+200-6+300	Parmod Ram	75-100	Semi Perma	Boundary Wall	Squatter	SC
62	Balha	Mansi	6+300-6+400	Subodh Kumar	50-75	Temp	Hut	Squatter	NTH
63	Balha	Mansi	6+300-6+400	Bharat Singh	25-50	Semi Perma	Shop	Encroacher	BPL
64	Khirnia	Chautham	6+500-6+600	Biro Pandit	50-75	Temp	House	Squatter	BPL
65	Khirnia	Chautham	6+500-6+600	Mahadev Sharma	25-50	Temp	Hut	Squatter	BPL
66	Khirnia	Chautham	6+500-6+600	Ranjit Sharma	50-75	Temp	House	Squatter	BPL
67	Khirnia	Chautham	6+500-6+600	Bablu Sharma	50-75	Temp	Hut	Squatter	PHH

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
68	Khirnia	Chautham	6+500-6+600	Bablu Sharma	50-75	Temp	House	Squatter	
69	Khirnia	Chautham	6+500-6+600	Ram Bilash Pandit	50-75	Temp	Hut	Squatter	BPL
70	Khirnia	Chautham	6+500-6+600	Sanjay Pandit	50-75	Temp	House	Encroacher	BPL
71	Khirnia	Chautham	6+600-6+700	Banarsi Pandit	25-50	Semi Perma	House	Encroacher	
72	Khirnia	Chautham	6+600-6+700	Sachitanand Prasad	0-25	Semi Perma	Cattleshed	Squatter	
73	Khirnia	Chautham	6+700-6+800	Suresh Thakur	75-100	Semi Perma	House	Squatter	BPL
74	Khirnia	Chautham	6+700-6+800	Tamatar Thakur	75-100	Temp	House	Squatter	NTH
75	Khirnia	Chautham	6+700-6+800	Gopal Choudhary	75-100	Semi Perma	House	Squatter	SC
76	Khirnia	Chautham	6+700-6+800	Gopal Choudhary	75-100	Temp	Hut	Squatter	
77	Khirnia	Chautham	6+700-6+800	Borhan Choudhary	75-100	Semi Perma	House	Squatter	BPL
78	Khirnia	Chautham	6+800-6+900	Manoj Choudhary	75-100	Temp	House	Squatter	NTH
79	Khirnia	Chautham	6+800-6+900	Raja Ram Choudhary	75-100	Temp	House	Squatter	BPL
80	Khirnia	Chautham	6+800-6+900	Kailash Choudhary	75-100	Temp	Hut	Squatter	BPL
81	Khirnia	Chautham	6+800-6+900	Sudhish Thakur	50-75	Temp	Hut	Squatter	BPL
82	Khirnia	Chautham	6+800-6+900	Jitendra Thakur	75-100	Permanent	Toilet	Squatter	BPL
83	Khirnia	Chautham	6+800-6+900	Jagdish Thakur	75-100	Semi Perma	House	Squatter	BPL
84	Khirnia	Chautham	6+800-6+900	Bhuttu Choudhary	75-100	Temp	Cattleshed	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
85	Khirnia	Chautham	6+800-6+900	Parmod Choudhary	75-100	Temp	Hut	Squatter	BPL
86	Khirnia	Chautham	6+800-6+900	Vimla Devi	75-100	Temp	Hut	Squatter	BPL
87	Khirnia	Chautham	6+800-6+900	Manraj Thakur	75-100	Temp	House	Squatter	BPL
88	Khirnia	Chautham	6+900-7+000	Kaleshar Thakur	75-100	Temp	Hut	Squatter	NTH
89	Khirnia	Chautham	6+900-7+000	Damodar Thakur	75-100	Temp	Hut	Squatter	BPL
90	Khirnia	Chautham	6+900-7+000	Kapildev Thakur	75-100	Temp	Hut	Squatter	BPL
91	Khirnia	Chautham	6+900-7+000	Kisho Thakur	75-100	Temp	Hut	Squatter	BPL
92	Khirnia	Chautham	6+900-7+000	Gujo Thakur	75-100	Semi Perma	House	Squatter	BPL
93	Hardiya	Chautham	8+050-8+100	Rana Singh	75-100	Semi Perma	Poultry Farm	Squatter	
94	Hardiya	Chautham	8+050-8+100	Rana Singh	75-100	Temp	Shop	Squatter	
95	Hardiya	Chautham	8+050-8+100	Jogindra Chaudhary	75-100	Semi Perma	Shop	Squatter	NTH
96	Dighari (Bangalia)	Chautham	9+950-10+000	Chandeshwari Yadav	75-100	Permanent	House	Titleholderr	
97	Dighari (Bangalia)	Chautham	9+950-10+000	Chandeshwari Yadav	75-100	Permanent	Temple	Titleholderr	
98	Dighari (Bangalia)	Chautham	9+950-10+000	Chandeshwari Yadav	75-100	Semi Perma	Under Cons	Titleholderr	
99	Dighari (Bangalia)	Chautham	10+150-10+200	Mato Singh	75-100	Semi Perma	House	Titleholderr	
100	Dighari (Bangalia)	Chautham	10+150-10+200	Mato Singh	75-100	Semi Perma	Cattleshed	Titleholderr	
101	Dighari (Bangalia)	Chautham	10+150-10+200	Hardev Singh	75-100	Semi Perma	Toilet	Titleholderr	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
102	Dighari (Bangalia)	Chautham	10+350-10+400	Chandradev Singh	75-100	Permanent	Toilet	Titleholderr	
103	Dighari (Bangalia)	Chautham	10+350-10+400	Chandradev Singh	75-100	Permanent	House	Titleholderr	
104	Dighari (Bangalia)	Chautham	10+350-10+400	Chandradev Singh	75-100	Permanent	Kitchen	Titleholderr	
105	Dighari (Bangalia)	Chautham	10+350-10+400	Ashok Singh	75-100	Temp	Hut	Titleholderr	
106	Dighari (Bangalia)	Chautham	10+350-10+400	Ashok Singh	75-100	Semi Perma	Toilet	Titleholderr	
107	Dighari (Bangalia)	Chautham	10+350-10+400	Upendra Singh	75-100	Temp	House	Titleholderr	
108	Dighari (Bangalia)	Chautham	10+350-10+400	Upendra Singh	75-100	Temp	Hut	Titleholderr	
109	Dighari (Bangalia)	Chautham	10+350-10+400	Upendra Singh	75-100	Temp	Kitchen	Titleholderr	
110	Dighari (Bangalia)	Chautham	10+400-10+450	Vinod Singh	75-100	Temp	Hut	Titleholderr	
111	Dighari (Bangalia)	Chautham	10+400-10+450	Vinod Singh	75-100	Temp	Hut	Titleholderr	
112	Dhamahara	Chautham	11+650-11+700	Ram Pravesh Kumar	75-100	Temp	Hut	Titleholderr	
113	Dhamahara	Chautham	11+650-11+700	Ram Pravesh Kumar	75-100	Temp	Hut	Titleholderr	
114	Dhamahara	Chautham	11+650-11+700	Ram Pravesh Kumar	75-100	Temp	Hut	Titleholderr	
115	Dhamahara	Chautham	11+650-11+700	Bauna Ram	75-100	Temp	Hut	Titleholderr	
116	Dhamahara	Chautham	11+650-11+700	Bauna Ram	75-100	Permanent	Toilet	Titleholderr	
117	Dhamahara	Chautham	11+400-11+450	Chandra Kishore Mistri	75-100	Temp	Cattleshed	Titleholderr	
118	Dhamahara	Chautham	11+600-11+650	Vishun Dev Singh	75-100	Temp	Hut	Titleholderr	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
119	Dhamahara	Chautham	11+600-11+650	Vishun Dev Singh	75-100	Permanent	Toilet	Titleholderr	
120	Dhamahara	Chautham	11+600-11+650	Vishun Dev Singh	75-100	Temp	Hut	Titleholderr	
121	Dhamahara	Chautham	11+650-11+700	Sakal Dev Singh	75-100	Temp	Hut	Titleholderr	
122	Dhamahara	Chautham	11+650-11+700	Sakal Dev Singh	75-100	Permanent	Toilet	Titleholderr	
123	Dhamahara (New Banglia)	Chautham	12+250-12+300	Ahsok Yadav	75-100	Temp	Hut	Titleholderr	
124	Dhamahara (New Banglia)	Chautham	12+250-12+300	Ahsok Yadav	75-100	Permanent	House	Titleholderr	
125	Dhamahara (New Banglia)	Chautham	12+250-12+300	Ahsok Yadav	75-100	Temp	Hut	Titleholderr	
126	Dhamahara (New Banglia)	Chautham	12+250-12+300	Ahsok Yadav	75-100	Semi Perma	House	Titleholderr	
127	Dhamahara (New Banglia)	Chautham	12+250-12+300	Ahsok Yadav	75-100	Temp	House	Titleholderr	
128	Dhamahara (New Banglia)	Chautham	12+300-12+350	Wakil Yadav	75-100	Semi Perma	House	Titleholderr	
129	Dhamahara (New Banglia)	Chautham	12+300-12+350	Wakil Yadav	75-100	Semi Perma	House	Titleholderr	
130	Dhamahara (New Banglia)	Chautham	12+300-12+350	Wakil Yadav	75-100	Temp	Hut	Titleholderr	
131	Dhamahara (New Banglia)	Chautham	12+300-12+350	Digambar Yadav	75-100	Temp	House	Titleholderr	
132	Dhamahara (New Banglia)	Chautham	12+300-12+350	Digambar Yadav	75-100	Semi Perma	House	Titleholderr	
133	Dhamahara	Chautham	12+300-12+350	Digambar Yadav	75-100	Temp	Hut	Titleholderr	
134	Dhamahara	Chautham	12+300-12+350	Jawahar Yadav	75-100	Permanent	House	Titleholderr	
135	Dhamahara	Chautham	12+300-12+350	Jawahar Yadav	75-100	Permanent	House	Titleholderr	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
136	Dhamahara	Chautham	12+300-12+350	Jawahar Yadav	75-100	Temp	House	Titleholderr	
137	Dhamahara (Shrinagar)	Chautham	12+900-12+950	Jageswar Sada	75-100	Temp	House	Titleholderr	
138	Dhamahara (Shrinagar)	Chautham	12+900-12+950	Jageswar Sada	75-100	Temp	Hut	Titleholderr	
139	Dhamahara (Shrinagar)	Chautham	12+300-12+950	Jageswar Sada	75-100	Temp	Hut	Squatter	
140	Dhamahara	Chautham	12+950-13+000	Mukesh Kumar	75-100	Temp	House	Titleholderr	
141	Dhamahara	Chautham	12+950-13+000	Mukesh Kumar	75-100	Temp	House	Titleholderr	
142	Dhamahara	Chautham	12+950-13+000	Mukesh Kumar	75-100	Temp	House	Titleholderr	
143	Dhamahara	Chautham	12+950-13+000	Sanjay Sharma	75-100	Temp	Hut	Titleholderr	
144	Dhamahara	Chautham	13+100-13+150	Suresh Sah	75-100	Temp	Hut	Titleholderr	
145	Dhamahara	Chautham	13+150-13+200	Lalita Devi	75-100	Semi Perma	Toilet	Titleholderr	
146	Dhamahara	Chautham	13+150-13+200	Lalita Devi	75-100	Temp	House	Titleholderr	
147	Dhamahara	Chautham	13+150-13+200	Bechan Sah	75-100	Semi Perma	Toilet	Titleholderr	
148	Dhamahara	Chautham	13+150-13+200	Bechan Sah	75-100	Permanent	Toilet	Titleholderr	
149	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Upendra Sigh	75-100	Semi Perma	Toilet	Titleholderr	
150	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Upendra Sigh	75-100	Temp	House	Titleholderr	
151	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Sambhu Singh	75-100	Temp	House	Titleholderr	
152	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Sambhu Singh	75-100	Temp	House	Titleholderr	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
153	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Semi Perma	Resi+Com	Titleholderr	
154	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Semi Perma	Clinic	Titleholderr	
155	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Semi Perma	Toilet	Titleholderr	
156	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Temp	Shop	Titleholderr	
157	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Temp	Resi+Com	Titleholderr	
158	Buchcha (Dhanchhar)	Chautham	13+850-13+900	Ram Lakhan Singh	75-100	Temp	House	Titleholderr	
159	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Sulekha Devi	75-100	Temp	Hut	Titleholderr	
160	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Sulekha Devi	75-100	Semi Perma	Under Cons	Titleholderr	
161	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Sulekha Devi	75-100	Temp	Cattleshed	Titleholderr	
162	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Sulekha Devi	75-100	Semi Perma	Toilet	Titleholderr	
163	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Gajendra Kumar Sahu	75-100	Temp	Hut	Titleholderr	
164	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Gajendra Kumar Sahu	75-100	Temp	House	Titleholderr	
165	Buchcha (Dhanchhar)	Chautham	13+950-14+000	Gajendra Kumar Sahu	75-100	Semi Perma	Toilet	Titleholderr	
166	Buchcha (Dhanchhar)	Chautham	14+000-14+100	Girja Devi	75-100	Temp	Hut	Titleholderr	
167	Buchcha (Dhanchhar)	Chautham	14+000-14+100	Girja Devi	75-100	Permanent	House	Titleholderr	
168	Buchcha (Dhanchhar)	Chautham	14+100-14+150	Kishore Sah	75-100	Semi Perma	Under Cons	Titleholderr	
169	Buchcha (Dhanchhar)	Chautham	14+150-14+200	Pramod Singh	75-100	Temp	House	Titleholderr	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
170	Buchcha (Dhanchhar)	Chautham	14+150-14+200	Pramod Singh	75-100	Semi Perma	House	Titleholderr	
171	Buchcha (Dhanchhar)	Chautham	14+150-14+200	Pramod Singh	75-100	Temp	House	Titleholderr	
172	Buchcha (Dhanchhar)	Chautham	14+150-14+200	Pramod Singh	75-100	Permanent	Toilet	Titleholderr	
173	Kopadiya	Salakhua	16+300-16+400	Manoj Kumar	25-50	Semi Perma	House	Encroacher	BPL
174	Kopadiya	Salakhua	16+700-16+800	Harinarayan Yadav	0-25	Temp	Cattleshed	Encroacher	BPL
175	Kopadiya	Salakhua	16+700-16+800	Shyam Sunder Yadav	0-25	Temp	House	Squatter	WHH
176	Kopadiya	Salakhua	16+800-16+900	Sanjendra Yadav	25-50	Semi Perma	Shop	Encroacher	BPL
177	Kopadiya	Salakhua	16+800-16+900	Kishore Yadav	0-25	Temp	Cattleshed	Squatter	BPL
178	Kopadiya	Salakhua	17+000-17+100	Dhaneswar Yadav	25-50	Temp	Hut	Encroacher	BPL
179	Kopadiya	Salakhua	17+100-17+200	Bindsari Baghta	50-75	Semi Perma	Shop	Encroacher	BPL
180	Kopadiya	Salakhua	17+300-17+400	Lahtan Yadav	75-100	Temp	Hut	Squatter	BPL
181	Kopadiya	Salakhua	17+300-17+400	Ajay Kumar	50-75	Semi Perma	Abandoned	Encroacher	
182	Kopadiya	Salakhua	17+300-17+400	Ram Pravesh Mahanth (Pujari)	50-75	Temp	Hut	Squatter	BPL
183	Kopadiya	Salakhua	17+300-17+400	Pintu Yadav	25-50	Temp	Shop	Encroacher	BPL
184	Kopadiya	Salakhua	17+500-17+600	Samuli Yadav	75-100	Temp	Kiosk	Squatter	NTH
185	Kopadiya	Salakhua	17+600-17+700	Sanjit Kumar	75-100	Temp	Kiosk	Squatter	BPL
186	Kopadiya	Salakhua	17+700-17+800	Opendar Kumar	50-75	Semi Perma	Shop	Encroacher	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
187	Kopadiya	Salakhua	17+700-17+800	Sunil Yadav	75-100	Temp	Shop	Squatter	BPL
188	Kopadiya	Salakhua	17+900-18+000	Subodh Yadav	75-100	Temp	Hut	Squatter	BPL
189	Kopadiya	Salakhua	18+100-19+200	Rajendra Yadav	75-100	Temp	Godown	Squatter	BPL
190	Mobarakpur	Salakhua	22+000-22+100	Uday Yadav	25-50	Temp	Cattleshed	Encroacher	BPL
191	Mobarakpur	Salakhua	22+000-22+100	Manoj Ram	50-75	Temp	House	Squatter	BPL
192	Mobarakpur	Salakhua	22+000-22+100	Ranjit Ram	75-100	Temp	House	Squatter	SC
193	Mobarakpur	Salakhua	22+000-22+100	Saini Ram	75-100	Temp	House	Squatter	SC
194	Mobarakpur	Salakhua	22+000-22+100	Ram Pukar Yadav	50-75	Temp	Abandoned	Encroacher	BPL
195	Mobarakpur	Salakhua	22+000-22+100	Mukesh Ram	25-50	Temp	Hut	Squatter	SC
196	Mobarakpur	Salakhua	22+000-22+100	Tarachand Ram	50-75	Semi Perma	House	Squatter	SC
197	Mobarakpur	Salakhua	22+000-22+100	Pravesh Ram	75-100	Semi Perma	House	Squatter	SC
198	Mobarakpur	Salakhua	22+100-22+200	Lalan Ram	75-100	Temp	House	Squatter	SC
199	Mobarakpur	Salakhua	22+100-22+200	Sipin Ram	75-100	Temp	House	Squatter	SC
200	Mobarakpur	Salakhua	22+100-22+200	Ram Bilash Yadav	75-100	Temp	Kiosk	Squatter	BPL
201	Mobarakpur	Salakhua	22+200-22+300	Vinod Yadav	75-100	Semi Perma	Toilet	Squatter	BPL
202	Mobarakpur	Salakhua	22+200-22+300	Vishun Dev Yadav	75-100	Semi Perma	Toilet	Squatter	BPL
203	Gurgawan	Salakhua	23+100-23+200	Rajendra Singh	75-100	Semi Perma	House	Squatter	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
204	Gurgawan	Salakhua	23+300-23+400	Bipin Kumar	75-100	Semi Perma	Shop	Encroacher	BPL
205	Gurgawan	Salakhua	23+300-23+400	Bipin Kumar	75-100	Permanent	Shop	Squatter	
206	Gurgawan	Salakhua	23+300-23+400	Sanoj Yadav	75-100	Temp	Kiosk	Squatter	BPL
207	Gurgawan	Salakhua	23+400-23+500	Umesh Sah	75-100	Temp	Small Eatery	Squatter	SC
208	Gurgawan	Salakhua	23+400-23+500	Chandan Yadav	75-100	Semi Perma	Shop	Squatter	BPL
209	Gurgawan	Salakhua	23+600-23+700	Sudhir Pandit	75-100	Temp	Store Room	Squatter	NTH
210	Gurgawan	Salakhua	23+600-23+700	Ramvilash Malik	75-100	Temp	House	Squatter	SC
211	Gurgawan	Salakhua	23+600-23+700	Ram Malik	75-100	Temp	Hut	Squatter	SC
212	Gurgawan	Salakhua	23+600-23+700	Bilash Malik	50-75	Permanent	House	Encroacher	SC
213	Gurgawan	Salakhua	23+600-23+700	Fullo Malik	25-50	Permanent	House	Encroacher	SC
214	Gurgawan (Phensaha)	Salakhua	23+600-23+700	Vimal Chaudhary	75-100	Semi Perma	House	Squatter	SC
215	Gurgawan (Phensaha)	Salakhua	23+600-23+700	Inderjit Chaudhary	75-100	Semi Perma	House	Encroacher	SC
216	Gurgawan (Phensaha)	Salakhua	23+700-23+800	Babita Devi	0-25	Permanent	House	Encroacher	SC
217	Gurgawan (Phensaha)	Salakhua	23+800-23+900	Md Imran	75-100	Temp	Kiosk	Squatter	BPL
218	Gurgawan (Phensaha)	Salakhua	23+800-23+900	Md Iqramul Haque	75-100	Semi Perma	Resi+Com	Squatter	NTH
219	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Imteyazul Haque	75-100	Permanent	House	Encroacher	BPL
220	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Javed Akhtar	50-75	Semi Perma	House	Encroacher	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
221	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Nasarullah	75-100	Permanent	Toilet	Squatter	WHH
222	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Rajiya Khatun	75-100	Semi Perma	Kitchen	Squatter	BPL
223	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Rajiya Khatun	75-100	Semi Perma	House	Squatter	
224	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Zohair Alam	75-100	Permanent	Toilet	Squatter	BPL
225	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Ozair Alam	75-100	Semi Perma	House	Squatter	NTH
226	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Mujahidul Islam	75-100	Semi Perma	House	Squatter	BPL
227	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Noorul Islam	75-100	Semi Perma	Shop	Squatter	BPL
228	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Salman Alam	50-75	Semi Perma	Shop	Encroacher	BPL
229	Gurgawan (Phensaha)	Salakhua	24+000-24+100	Md Noman Ali	75-100	Semi Perma	House	Squatter	WHH
230	Gurgawan (Phensaha)	Salakhua	24+000-24+100	Fazlu Rahman	50-75	Semi Perma	Shop	Squatter	BPL
231	Gurgawan (Phensaha)	Salakhua	24+000-24+100	Md Sakirali	75-100	Temp	Kiosk	Squatter	NTH
232	Gouspur	Salakhua	24+000-24+100	Md Nasir Hussain	50-75	Semi Perma	Shop	Encroacher	BPL
233	Gouspur	Salakhua	24+000-24+100	Md Gulam Sarwar	0-25	Semi Perma	Shop	Encroacher	BPL
234	Gouspur	Salakhua	24+000-24+100	Md Anwarul Hasan	25-50	Semi Perma	Shop	Encroacher	
235	Gouspur	Salakhua	24+200-24+300	Md Masir Alam	75-100	Temp	Hut	Squatter	BPL
236	Gouspur	Salakhua	24+200-24+300	Md Hasmat	75-100	Semi Perma	Boundary Wall	Squatter	BPL
237	Gouspur	Salakhua	24+200-24+300	Molana Ahtesham	50-75	Semi Perma	Shop	Squatter	NTH

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
238	Gouspur	Salakhua	24+400-24+500	Md Insul Nadaf	75-100	Semi Perma	Kitchen	Squatter	BPL
239	Gouspur	Salakhua	24+400-24+500	Md Ibrahim Nadaf	75-100	Semi Perma	House	Squatter	BPL
240	Gouspur	Salakhua	24+400-24+500	Md Ibrahim Nadaf	75-100	Permanent	Toilet	Squatter	
241	Gouspur	Salakhua	24+400-24+500	Md Wakil Nadaf	75-100	Semi Perma	Cattleshed	Squatter	BPL
242	Gouspur	Salakhua	24+400-24+500	Md Mazlum Nadaf	75-100	Semi Perma	Hut	Squatter	BPL
243	Gouspur	Salakhua	24+400-24+500	Md Rakim Nadaf	75-100	Semi Perma	Cattleshed	Squatter	BPL
244	Gouspur	Salakhua	24+400-24+500	Md Karim Nadaf	75-100	Semi Perma	Shop	Encroacher	
245	Gouspur	Salakhua	24+400-24+500	Asma Khatun	75-100	Semi Perma	House	Squatter	BPL
246	Gouspur	Salakhua	24+400-24+500	Asma Khatun	50-75	Permanent	House	Encroacher	
247	Gouspur	Salakhua	24+400-24+500	Asma Khatun	75-100	Temp	Hut	Squatter	
248	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+000-25+100	Dilkhush Yadav	75-100	Temp	Kiosk	Squatter	NTH
249	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Ranjit Malik	25-50	Temp	House	Squatter	SC
250	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Lallu Malik	0-25	Temp	House	Squatter	SC
251	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Sikandar Malik	25-50	Temp	House	Squatter	SC
252	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Sikandar Malik	25-50	Temp	Hut	Squatter	
253	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Pankaj Malik	25-50	Temp	Hut	Squatter	SC
254	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Sikandra Thakur (Opender Thakur)	25-50	Temp	Hut	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
255	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Vijendra Thakur	25-50	Temp	Small Eatery	Squatter	BPL
256	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400-25+500	Upendra Thakyr	0-25	Temp	Shop	Squatter	NTH
257	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+500-25+600	Upendra Yadav	75-100	Temp	Kiosk	Squatter	NTH
258	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+300-26+000	Indrajit Sharma	50-75	Semi Perma	House	Squatter	SC
259	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+900-26+000	Kundan Kumar	75-100	Temp	Kiosk	Squatter	SC
260	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+900-26+000	Kapil Sharma	25-50	Temp	Shop	Squatter	SC
261	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+900-26+000	Umesh Yadav	75-100	Temp	Kiosk	Squatter	BPL
262	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+100-26+200	Hira Kumar Sharma	75-100	Temp	Kiosk	Squatter	SC
263	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+200-26+300	Er. Ram Kumar	75-100	Semi Perma	Boundary Wall	Squatter	
264	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+200-26+300	Sanjeev Kumar	25-50	Semi Perma	Pvt. Office	Encroacher	
265	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+200-26+300	Anjali Kumari	75-100	Semi Perma	Boundary Wall	Squatter	BPL
266	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+300-26+400	Ramdev Swarnkar	75-100	Temp	Hut	Squatter	BPL
267	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+300-26+400	Shambhu Poddar	50-75	Temp	House	Squatter	BPL
268	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+400-26+500	Mumtaz Begam	25-50	Permanent	Shed	Encroacher	
269	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+400-26+500	Md Shamshad Ahmad	25-50	Semi Perma	House	Encroacher	BPL
270	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+500-26+600	Bhola Swarnkar	75-100	Permanent	Gate	Squatter	BPL
271	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+600-26+700	Sudhir Kumar Singh	75-100	Permanent	Toilet	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
272	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+600-26+700	Rajesh Mehta	25-50	Temp	Hut	Encroacher	BPL
273	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+700-26+800	Sankar Poddar	25-50	Temp	Shop	Encroacher	
274	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Shampat Jaysawal	50-75	Semi Perma	Shop	Encroacher	BPL
275	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Munni Devi	50-75	Semi Perma	Shop	Encroacher	BPL
276	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Sachin Kumar	75-100	Semi Perma	House	Squatter	NTH
277	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Janki Devi	50-75	Semi Perma	House	Encroacher	BPL
278	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Jai Narayan Swarnkar	0-25	Permanent	House	Encroacher	BPL
279	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Jai Narayan Swarnkar	50-75	Semi Perma	Shop	Encroacher	
280	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Arun Swarnkar	0-25	Permanent	House	Encroacher	
281	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Ram Narayan Swarnkar	25-50	Semi Perma	House	Encroacher	BPL
282	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Gautam Kumar	75-100	Semi Perma	Shed	Squatter	BPL
283	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Gautam Kumar	0-25	Permanent	House	Encroacher	
284	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Rajesh Swarnkar	50-75	Semi Perma	House	Encroacher	BPL
285	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Hira Kumar	0-25	Permanent	Resi+Com	Encroacher	
286	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Binda Devi	25-50	Temp	House	Encroacher	
287	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Rana Jaiswal	75-100	Temp	Shop	Squatter	BPL
288	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Mahavir Prasad	75-100	Semi Perma	Shop	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
289	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Gurudev Kumar	75-100	Temp	Kiosk	Squatter	BPL
290	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+100-27+200	Bishundev Sah	75-100	Temp	Shop	Squatter	BPL
291	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+200-27+300	Biso Sah (Gautam Sah)	75-100	Semi Perma	Boundary Wall	Squatter	NTH
292	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+300-27+400	Chote Lal Chaudhary	75-100	Semi Perma	Under Cons	Squatter	SC
293	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+300-27+400	Upendra Chaudhary	0-25	Semi Perma	House	Encroacher	SC
294	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+300-27+400	Arjun Prasad Yadav	75-100	Semi Perma	Resi+Com	Squatter	BPL
295	Simri Bakhtiyarpur	Simri Bakhtiyarpur	27+300-27+400	Suraj Kumar	0-25	Semi Perma	House	Encroacher	BPL
296	Mansi (Khutia)	Mansi	0+000-0+100	Indal Yadav	75-100	Temp	Kiosk	Squatter	NTH
297	Mansi (Khutia)	Mansi	0+000-0+100	Raushan Thakur	75-100	Temp	Hut	Squatter	BPL
298	Mansi (Khutia)	Mansi	0+300-0+400	Suresh Rajak	0-25	Temp	Shop	Squatter	SC
299	Mansi (Chak Hussaini)	Mansi	0+500-0+600	Santosh Kumar Thakur	75-100	Temp	Shop	Squatter	BPL
300	Mansi (Chak Hussaini)	Mansi	0+500-0+600	Virbal Kumar	75-100	Temp	Shop	Squatter	BPL
301	Mansi (Chak Hussaini)	Mansi	0+800-0+900	Kishor Kumar Bhagat	50-75	Temp	Shop	Squatter	BPL
302	Mansi (Chak Hussaini)	Mansi	0+800-0+900	Arjun Poddar	0-25	Semi Perma	Shop	Encroacher	BPL
303	Mansi (Chak Hussaini)	Mansi	0+800-0+900	Nagandra Tamoli	0-25	Temp	Small Eatery	Encroacher	BPL
304	Mansi (Chak Hussaini)	Mansi	0+800-0+900	Mukesh Singh	75-100	Temp	Kiosk	Squatter	NTH
305	Mansi (Chak Hussaini)	Mansi	0+900-1+000	Gopal Poddar	0-25	Temp	Small Eatery	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
306	Mansi (Chak Hussaini)	Mansi	1+000-1+200	Manish Kumar	0-25	Temp	Shop	Squatter	BPL
307	Mansi (Chak Hussaini)	Mansi	1+000-1+200	Jay Prakash Gupta	25-50	Semi Perma	Shop	Squatter	BPL
308	Mansi (Chak Hussaini)	Mansi	1+000-1+200	Ashish Kumar	0-25	Semi Perma	Shop	Squatter	BPL
309	Mansi (Chak Hussaini)	Mansi	1+200-1+300	Pawan Kumar	75-100	Semi Perma	Shop	Squatter	NTH
310	Mansi (Chak Hussaini)	Mansi	1+300-1+400	Akhalesh Ray	75-100	Semi Perma	Shop	Squatter	BPL
311	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Wakil Singh	50-75	Semi Perma	Shop	Squatter	BPL
312	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Arvind Singh	50-75	Semi Perma	Shop	Squatter	BPL
313	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Arun Kumar	75-100	Semi Perma	House	Squatter	BPL
314	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Ganga Prasad Singh	50-75	Temp	House	Squatter	BPL
315	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Rajesh Kumar Singh	75-100	Semi Perma	Shop	Squatter	BPL
316	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Bittu Kumar	75-100	Semi Perma	Shop	Squatter	BPL
317	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Parmod Kumar Singh	75-100	Semi Perma	Shop	Squatter	BPL
318	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Gita Devi	75-100	Semi Perma	Boundary Wall	Squatter	BPL
319	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Sadanand Singh	50-75	Semi Perma	Shop	Squatter	NTH
320	Mansi (Chak Hussaini)	Mansi	1+400-1+500	Rajo Singh	75-100	Temp	Kiosk	Squatter	BPL
321	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Raju Kumar	75-100	Semi Perma	Boundary Wall	Squatter	BPL
322	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Balmiki Singh	25-50	Semi Perma	House	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
323	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Manoj Kumar	25-50	Semi Perma	House	Squatter	BPL
324	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Sunita Devi	75-100	Semi Perma	Shop	Squatter	BPL
325	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Rohit Kumar	50-75	Semi Perma	Shop	Squatter	BPL
326	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Mina Devi	75-100	Temp	Shop	Squatter	BPL
327	Mansi (Chak Hussaini)	Mansi	1+500-1+600	Sanjay Singh	75-100	Temp	Hut	Squatter	BPL
328	Mansi (Chak Hussaini)	Mansi	1+600-1+700	Shushil Kumar	75-100	Temp	Kiosk	Squatter	BPL
329	Balha	Mansi	5+600-5+700	Sharvan Sah	25-50	Semi Perma	Shop	Squatter	NTH
330	Balha	Mansi	5+600-5+700	Radhe Sah	25-50	Semi Perma	Shop	Squatter	NTH
331	Balha	Mansi	5+600-5+700	Bhshan Sharma	75-100	Permanent	Toilet	Squatter	BPL
332	Balha	Mansi	5+700-5+800	Suman Kumar	75-100	Semi Perma	House	Squatter	PHH
333	Balha	Mansi	5+700-5+800	Shakar Sharma	75-100	Temp	House	Squatter	BPL
334	Balha	Mansi	5+700-5+800	Montu Sharma	50-75	Semi Perma	House	Squatter	BPL
335	Balha	Mansi	5+700-5+800	Wakil Yadav	75-100	Temp	Kiosk	Squatter	NTH
336	Balha	Mansi	5+700-5+800	Anurudh Sharma	75-100	Semi Perma	Bathroom	Squatter	
337	Balha	Mansi	5+700-5+800	Molan Sharma	75-100	Temp	House	Squatter	BPL
338	Balha	Mansi	5+700-5+800	Molan Sharma	75-100	Semi Perma	Temple	Squatter	
339	Balha	Mansi	5+700-5+800	Sagar Sharma	75-100	Semi Perma	House	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
340	Balha	Mansi	5+700-5+800	Sagar Sharma	75-100	Permanent	Toilet	Squatter	
341	Balha	Mansi	5+700-5+800	Santosh Yadav	75-100	Semi Perma	Toilet	Squatter	NTH
342	Balha	Mansi	5+700-5+800	Yadunadan Sah	75-100	Semi Perma	Aganwadi	Squatter	NTH
343	Balha	Mansi	5+700-5+800	Yadunadan Sah	75-100	Permanent	Toilet	Squatter	
344	Balha	Mansi	5+700-5+800	Sudhir Kumar Yadav	75-100	Permanent	Toilet	Squatter	BPL
345	Balha	Mansi	6+100-6+200	Sambhu Bharti	75-100	Temp	Kiosk	Squatter	BPL
346	Balha	Mansi	6+100-6+200	Vinod Pandit	25-50	Semi Perma	House	Squatter	BPL
347	Balha	Mansi	6+200-6+300	Arun Pandit	25-50	Semi Perma	Shop	Encroacher	BPL
348	Balha	Mansi	6+300-6+400	Sunil Sah	75-100	Semi Perma	Boundary Wall	Squatter	NTH
349	Balha	Mansi	6+300-6+400	Dharmbir Kumar	50-75	Temp	Shop	Squatter	SC
350	Balha	Mansi	6+300-6+400	Lalan Yadav	50-75	Semi Perma	Cattleshed	Squatter	BPL
351	Balha	Mansi	6+300-6+400	Giro Pandit	75-100	Semi Perma	Boundary Wall	Squatter	BPL
352	Khirnia	Chautham	6+400-6+500	Nivas Pandit	0-25	Semi Perma	House	Squatter	BPL
353	Khirnia	Chautham	6+600-6+700	Jhingo Pandit	50-75	Semi Perma	House	Squatter	WHH
354	Khirnia	Chautham	6+600-6+700	Ranjan Pandit	75-100	Temp	Shop	Squatter	NTH
355	Khirnia	Chautham	6+600-6+700	Ranjan Pandit	25-50	Semi Perma	House	Encroacher	
356	Khirnia	Chautham	6+600-6+700	Arun Pandit	75-100	Semi Perma	Cattleshed	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
357	Khirnia	Chautham	6+600-6+700	Sudhir Kumar	50-75	Semi Perma	House	Squatter	BPL
358	Khirnia	Chautham	6+600-6+700	Kailah Pandit	75-100	Semi Perma	House	Squatter	NTH
359	Khirnia	Chautham	6+700-6+800	Prakash Choudhary	75-100	Semi Perma	House	Squatter	SC
360	Khirnia	Chautham	6+700-6+800	Mahindra Choudhary	75-100	Semi Perma	House	Squatter	SC
361	Khirnia	Chautham	6+700-6+800	Sahida Khatun	50-75	Semi Perma	House	Squatter	BPL
362	Khirnia	Chautham	6+700-6+800	Ashish Kumar	75-100	Semi Perma	House	Squatter	NTH
363	Khirnia	Chautham	6+700-6+800	Shankar Choudhary	75-100	Semi Perma	House	Squatter	BPL
364	Khirnia	Chautham	6+700-6+800	Bhola Choudhary	75-100	Semi Perma	House	Squatter	BPL
365	Khirnia	Chautham	6+700-6+800	Manelal Choudhary	75-100	Semi Perma	House	Squatter	BPL
366	Khirnia	Chautham	6+800-6+900	Videshi Choudhary	25-50	Semi Perma	House	Squatter	BPL
367	Khirnia	Chautham	6+800-6+900	Sinkendra Choudhary	75-100	Semi Perma	House	Squatter	BPL
368	Khirnia	Chautham	6+800-6+900	Jay Jay Ram Choudhary	75-100	Semi Perma	Kiosk	Squatter	BPL
369	Khirnia	Chautham	6+800-6+900	Bhaya Ram Choudhary	75-100	Semi Perma	House	Squatter	BPL
370	Khirnia	Chautham	6+800-6+900	Ram Chandra Choudhary	25-50	Semi Perma	House	Squatter	BPL
371	Khirnia	Chautham	6+800-6+900	Tapendra Thakur	50-75	Temp	House	Squatter	NTH
372	Khirnia	Chautham	6+800-6+900	Rajendra Choudhary	25-50	Temp	House	Squatter	BPL
373	Khirnia	Chautham	6+800-6+900	Sikandar Choudhary	75-100	Semi Perma	House	Squatter	SC

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
374	Khirnia	Chautham	6+800-6+900	Mangal Choudhary	25-50	Semi Perma	House	Squatter	BPL
375	Khirnia	Chautham	6+800-6+900	Rohit Choudhary	75-100	Semi Perma	House	Squatter	BPL
376	Khirnia	Chautham	6+800-6+900	Anil Choudhary	75-100	Semi Perma	House	Squatter	BPL
377	Khirnia	Chautham	6+800-6+900	Pramod Choudhary	75-100	Semi Perma	House	Squatter	BPL
378	Khirnia	Chautham	6+800-6+900	Samrun Khatun	75-100	Temp	Resi+Com	Squatter	WHH
379	Khirnia	Chautham	6+900-7+000	Laddu Thakur	75-100	Temp	Hut	Squatter	BPL
380	Khirnia	Chautham	6+900-7+000	Bahadur Thakur	75-100	Temp	House	Squatter	BPL
381	Khirnia	Chautham	6+900-7+000	Mantun Thakur	75-100	Temp	House	Squatter	NTH
382	Khirnia	Chautham	6+900-7+000	Sikandar Thakur	75-100	Semi Perma	House	Squatter	BPL
383	Khirnia	Chautham	6+900-7+000	Baleshar Thakur	25-50	Temp	Hut	Squatter	BPL
384	Khirnia	Chautham	6+900-7+000	Akshay Kuamr	25-50	Temp	Hut	Squatter	NTH
385	Khirnia	Chautham	6+900-7+000	Jay Kumar Choudhary	50-75	Semi Perma	House	Squatter	BPL
386	Kopadiya	Salakhua	16+300-16+400	Pandav Kumar	0-25	Temp	Cattleshed	Squatter	WHH
387	Kopadiya	Salakhua	16+700-16+800	Parmod Yadav	50-75	Temp	Hut	Encroacher	BPL
388	Kopadiya	Salakhua	16+700-16+800	Dinesh Yadav	50-75	Temp	Cattleshed	Encroacher	BPL
389	Kopadiya	Salakhua	16+800-16+900	Baavichan Yadav	0-25	Temp	House	Squatter	BPL
390	Kopadiya	Salakhua	16+800-16+900	Karam Lal Yadav	25-50	Temp	Cattleshed	Encroacher	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
391	Kopadiya	Salakhua	16+800-16+900	Sailendra Yadav	25-50	Temp	Hut	Encroacher	BPL
392	Kopadiya	Salakhua	17+200-17+300	Murlidhar Yadav	50-75	Temp	Cattleshed	Encroacher	BPL
393	Kopadiya	Salakhua	17+200-17+300	Suresh Prasad Yadav	50-75	Temp	Cattleshed	Squatter	NTH
394	Kopadiya	Salakhua	17+200-17+300	Brajesh Yadav	75-100	Temp	Hut	Squatter	BPL
395	Kopadiya	Salakhua	17+200-17+300	Ram Charitra Yadav	25-50	Temp	Cattleshed	Squatter	BPL
396	Kopadiya	Salakhua	17+200-17+300	Kailash Yadav	75-100	Temp	Hut	Squatter	BPL
397	Kopadiya	Salakhua	17+300-17+400	Vilash Yadav	75-100	Temp	House	Squatter	BPL
398	Kopadiya	Salakhua	17+300-17+400	Indradev Yadav	50-75	Permanent	Toilet	Encroacher	
399	Kopadiya	Salakhua	17+300-17+400	Jagdish Yadav	50-75	Semi Perma	Shop	Squatter	BPL
400	Kopadiya	Salakhua	17+300-17+400	Dev Narayan Yadav	75-100	Semi Perma	House	Squatter	BPL
401	Kopadiya	Salakhua	17+300-17+400	Bipin Kumar	75-100	Temp	Kiosk	Squatter	BPL
402	Kopadiya	Salakhua	17+400-17+500	Saheb Kumar	25-50	Temp	Shop	Squatter	BPL
403	Kopadiya	Salakhua	17+500-17+600	Raj Kumar Ray (Santosh)	25-50	Temp	Hut	Encroacher	BPL
404	Kopadiya	Salakhua	17+500-17+600	Pradip Thakur	75-100	Temp	Kiosk	Squatter	BPL
405	Kopadiya	Salakhua	17+600-17+700	Nitish Yadav	75-100	Temp	Kiosk	Squatter	BPL
406	Kopadiya	Salakhua	17+600-17+700	Ram Dev Yadav	0-25	Temp	Cattleshed	Encroacher	BPL
407	Kopadiya	Salakhua	17+600-17+700	Gaure Lal Yadav	0-25	Temp	Cattleshed	Encroacher	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
408	Kopadiya	Salakhua	17+700-17+800	Kari Yadav	75-100	Temp	Kiosk	Squatter	NTH
409	Kopadiya	Salakhua	17+700-17+800	Sita Ram Ray	50-75	Temp	Kiosk	Squatter	NTH
410	Kopadiya	Salakhua	17+800-17+900	Gopal Yadav	75-100	Temp	Kiosk	Squatter	BPL
411	Kopadiya	Salakhua	17+800-17+900	Narayan Yadav	25-50	Semi Perma	Cattleshed	Encroacher	BPL
412	Kopadiya	Salakhua	17+900-18+000	Bipin Kumar	75-100	Temp	Shop	Squatter	BPL
413	Kopadiya	Salakhua	17+900-18+000	Amit Kumar	75-100	Temp	Kiosk	Squatter	BPL
414	Mobarakpur	Salakhua	22+000-22+100	Videsh Yadav	75-100	Semi Perma	House	Squatter	BPL
415	Mobarakpur	Salakhua	22+000-22+100	Ganesh Yadav Amin	50-75	Semi Perma	House	Encroacher	BPL
416	Mobarakpur	Salakhua	22+000-22+100	Surendra Ram	75-100	Temp	Kiosk	Squatter	SC
417	Mobarakpur	Salakhua	22+000-22+100	Pankaj Kumar Ram	25-50	Semi Perma	House	Encroacher	SC
418	Mobarakpur	Salakhua	22+000-22+100	Sanjay Choudhary	25-50	Temp	House	Squatter	SC
419	Mobarakpur	Salakhua	22+000-22+100	Manoj Choudhary	50-75	Temp	House	Squatter	SC
420	Mobarakpur	Salakhua	22+000-22+100	Arjun Choudhary	75-100	Semi Perma	Hut	Squatter	SC
421	Mobarakpur	Salakhua	22+000-22+100	Sudhir Ram	50-75	Semi Perma	House	Squatter	SC
422	Mobarakpur	Salakhua	22+000-22+100	Raj Kishor Ram	75-100	Semi Perma	Toilet	Squatter	SC
423	Mobarakpur	Salakhua	22+000-22+100	Bank Ram	75-100	Semi Perma	House	Squatter	SC
424	Mobarakpur	Salakhua	22+100-22+200	Giro Ram	25-50	Semi Perma	House	Squatter	SC

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
425	Mobarakpur	Salakhua	22+100-22+200	Abhay Ram	50-75	Semi Perma	Kitchen	Squatter	SC
426	Mobarakpur	Salakhua	22+100-22+200	Anirudh Ram	75-100	Temp	House	Squatter	SC
427	Mobarakpur	Salakhua	22+100-22+200	Anirudh Ram	0-25	Permanent	House	Encroacher	
428	Mobarakpur	Salakhua	22+100-22+200	Manoj Ram	75-100	Semi Perma	House	Squatter	SC
429	Mobarakpur	Salakhua	22+100-22+200	Manoj Ram	25-50	Permanent	House	Squatter	
430	Mobarakpur	Salakhua	22+100-22+200	Sanjay Ram	75-100	Semi Perma	House	Squatter	SC
431	Mobarakpur	Salakhua	22+100-22+200	Mahendra Yadav	75-100	Semi Perma	Shop	Squatter	BPL
432	Mobarakpur	Salakhua	22+100-22+200	Ravindra Ram	75-100	Semi Perma	Toilet	Squatter	SC
433	Mobarakpur	Salakhua	22+100-22+200	Deepak Ram	50-75	Semi Perma	House	Squatter	SC
434	Mobarakpur	Salakhua	22+200-22+300	Chandan Yadav	75-100	Temp	House	Squatter	BPL
435	Mobarakpur	Salakhua	22+200-22+300	Chandan Yadav	75-100	Semi Perma	Toilet	Squatter	
436	Mobarakpur	Salakhua	22+200-22+300	Rajo Yadav	75-100	Semi Perma	Toilet	Squatter	BPL
437	Mobarakpur	Salakhua	22+200-22+300	Bijali Yadav	75-100	Temp	Hut	Squatter	BPL
438	Mobarakpur	Salakhua	22+200-22+300	Mahanthi Yadav	25-50	Temp	House	Squatter	BPL
439	Mobarakpur	Salakhua	22+200-22+300	Ramesh Yadav	50-75	Temp	Cattleshed	Squatter	BPL
440	Gurgawan	Salakhua	23+300-23+400	Kuldeep Pandit	0-25	Semi Perma	Shop	Squatter	BPL
441	Gurgawan	Salakhua	23+300-23+400	Chandeswari Poddar	75-100	Semi Perma	House	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
442	Gurgawan	Salakhua	23+300-23+400	Chandeswari Poddar	25-50	Permanent	Under Cons	Encroacher	
443	Gurgawan	Salakhua	23+600-23+700	Sanjeet Yadav	75-100	Temp	Kiosk	Squatter	BPL
444	Gurgawan	Salakhua	23+600-23+700	Nageshwar Pandit	75-100	Temp	Hut	Squatter	BPL
445	Gurgawan	Salakhua	23+600-23+700	Ashok Chaudhary	75-100	Semi Perma	Toilet	Encroacher	
446	Gurgawan (Phensaha)	Salakhua	23+600-23+700	Lela Devi	75-100	Temp	House	Squatter	BPL
447	Gurgawan (Phensaha)	Salakhua	23+600-23+700	Anar Devi	75-100	Semi Perma	House	Squatter	BPL
448	Gurgawan (Phensaha)	Salakhua	23+600-23+700	Anar Devi	25-50	Permanent	House	Encroacher	
449	Gurgawan (Phensaha)	Salakhua	23+700-23+800	Suresh Chaudhary	75-100	Semi Perma	Resi+Com	Squatter	SC
450	Gurgawan (Phensaha)	Salakhua	23+700-23+800	Shankar Chaudhary	75-100	Semi Perma	Shop	Squatter	SC
451	Gurgawan (Phensaha)	Salakhua	23+700-23+800	Shankar Chaudhary	75-100	Temp	Shop	Squatter	
452	Gurgawan (Phensaha)	Salakhua	23+800-23+900	Rajiya Khatun	75-100	Semi Perma	Boundary Wall	Encroacher	BPL
453	Gurgawan (Phensaha)	Salakhua	23+800-23+900	Alam Ara	75-100	Semi Perma	Toilet	Squatter	BPL
454	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Mumtaz Alam	75-100	Semi Perma	Boundary Wall	Squatter	BPL
455	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Md Mokhtar	75-100	Semi Perma	Resi+Com	Squatter	BPL
456	Gurgawan (Phensaha)	Salakhua	23+900-24+000	Bibi Monira Khatun	75-100	Temp	Kiosk	Squatter	BPL
457	Gurgawan (Phensaha)	Salakhua	24+000-24+100	Md Samiullah	50-75	Semi Perma	Shop	Encroacher	
458	Gurgawan (Phensaha)	Salakhua	24+000-24+100	Md Samiullah	75-100	Semi Perma	Shop	Encroacher	

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
459	Gouspur	Salakhua	24+000-24+100	Ishrat Khatun	75-100	Semi Perma	Shop	Squatter	BPL
460	Gouspur	Salakhua	24+000-24+100	Md Owais	75-100	Semi Perma	Shop	Squatter	BPL
461	Gouspur	Salakhua	24+000-24+100	Md Akhter	75-100	Temp	Kiosk	Squatter	BPL
462	Gouspur	Salakhua	24+000-24+100	Md Afroz Alam	0-25	Semi Perma	Shop	Squatter	BPL
463	Gouspur	Salakhua	24+000-24+100	Md Shadab Ali	75-100	Semi Perma	Shop	Squatter	NTH
464	Gouspur	Salakhua	24+000-24+100	Md Zafar Ali	75-100	Temp	Kiosk	Squatter	BPL
465	Gouspur	Salakhua	24+000-24+100	Md Sajid Hussain	0-25	Semi Perma	Shop	Encroacher	
466	Gouspur	Salakhua	24+100+24+200	Sambhu Ram	75-100	Semi Perma	Under Cons	Squatter	SC
467	Gouspur	Salakhua	24+300+24+400	Md Manir Nadaf	25-50	Temp	Shop	Encroacher	BPL
468	Gouspur	Salakhua	24+400-24+500	Md Manir Nadaf	25-50	Semi Perma	House	Squatter	
469	Gouspur	Salakhua	24+400-24+500	Md Akbar	25-50	Semi Perma	House	Squatter	BPL
470	Gouspur	Salakhua	24+400-24+500	Md Murshid Nadaf	50-75	Semi Perma	House	Squatter	BPL
471	Gouspur	Salakhua	24+400-24+500	Md Shakil Nadaf	50-75	Semi Perma	Shop	Squatter	NTH
472	Gouspur	Salakhua	24+400-24+500	Sanjo Khatun	75-100	Semi Perma	Boundary Wall	Squatter	BPL
473	Gouspur	Salakhua	24+400-24+500	Md Zabir Nadaf	75-100	Permanent	House	Squatter	BPL
474	Gouspur	Salakhua	24+700-24+800	Mithlesh Yadav	50-75	Semi Perma	Shed	Encroacher	BPL
475	Gouspur	Salakhua	24+800-24+900	Sashi Yadav	75-100	Semi Perma	Boundary Wall	Encroacher	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
476	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400+25+500	Gurudev Thakur	0-25	Temp	House	Squatter	BPL
477	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400+25+500	Ram Pari Devi	50-75	Temp	Hut	Squatter	SC
478	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400+25+500	Murlidhar Yadav	75-100	Temp	Kiosk	Squatter	BPL
479	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400+25+500	Basudev Yadav	25-50	Temp	Small Eatery	Squatter	BPL
480	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+400+25+500	Ajay Yadav	25-50	Temp	Hut	Squatter	BPL
481	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Ravin Sharma	25-50	Temp	House	Encroacher	SC
482	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Laxman Sharma	50-75	Semi Perma	House	Squatter	SC
483	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Bhagwat Sahrma	50-75	Semi Perma	House	Squatter	SC
484	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Bhagwat Sahrma	25-50	Semi Perma	House	Encroacher	
485	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Harender Sharma	0-25	Temp	Hut	Encroacher	SC
486	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+700-25+800	Basant Sharma	25-50	Temp	Hut	Encroacher	SC
487	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+900-26+000	Raj Kumar Sharma	75-100	Temp	Hut	Squatter	SC
488	Simri Bakhtiyarpur	Simri Bakhtiyarpur	25+900-26+000	Ram Pukar Sharma	25-50	Semi Perma	Shop	Squatter	SC
489	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+300-26+400	Md Afroz Alam	75-100	Semi Perma	Boundary Wall	Encroacher	
490	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+400-26+500	Md Abdul Qayum	50-75	Semi Perma	Under Cons	Squatter	NTH
491	Simri Bakhtiyarpur	Simri Bakhtiyarpur	26+400-26+500	Md Abdul Qayum	25-50	Permanent	House	Encroacher	
492	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+400-26+500	Ashok Rajak	75-100	Semi Perma	House	Squatter	SC

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
493	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+500-26+600	Randhir Rajak	0-25	Semi Perma	House	Squatter	SC
494	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+500-26+600	Raja Swarnkar	0-25	Semi Perma	House	Squatter	NTH
495	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+500-26+600	Raja Swarnkar	75-100	Temp	Kiosk	Squatter	
496	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+500-26+600	Mahendra Singh	50-75	Semi Perma	Toilet	Squatter	BPL
497	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+600-26+700	Sanjay Kumar	50-75	Temp	Cattleshed	Squatter	BPL
498	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+600-26+700	Sanjay Kumar	25-50	Semi Perma	Cattleshed	Encroacher	
499	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	26+600-26+700	Nilam Devi	0-25	Temp	Hut	Encroacher	BPL
500	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Anuj Kumar	75-100	Semi Perma	Hotel	Squatter	NTH
501	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Ravindra Kumar	75-100	Semi Perma	House	Squatter	NTH
502	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Shri Ashok Kumar	75-100	Semi Perma	Shop	Squatter	BPL
503	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+000-27+100	Md Farood	50-75	Semi Perma	House	Encroacher	BPL
504	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Balmiki Chaudhary	75-100	Temp	Shop	Squatter	BPL
505	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Rama Shankar Bhagat	0-25	Temp	House	Encroacher	
506	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Uday Prasad Chaurasiya	75-100	Temp	Shop	Squatter	BPL
507	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Uday Prasad Chaurasiya	50-75	Semi Perma	House	Squatter	
508	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Pancha Nand Prasad	25-50	Semi Perma	Hotel	Squatter	BPL
509	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Vikram Kumar Jaiswal	75-100	Temp	Shop	Squatter	BPL

S.N.	Name of the Village	Name of Block	Chainage Kilometre	Name of the Owner	Scale of Impact (In %)	Type of Construction of Structure	Use of Structure	Status of Structure	Vulnerability Status
510	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Rahul Kumar	75-100	Temp	Kiosk	Squatter	BPL
511	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Rajeev Kumar Modi	0-25	Permanent	Resi+Com	Encroacher	BPL
512	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Vijay Modi	75-100	Semi Perma	Shop	Squatter	BPL
513	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+100-27+200	Shiv Ji Pandey	50-75	Semi Perma	Resi+Com	Squatter	
514	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+200-27+300	Gauri Pandey	75-100	Semi Perma	House	Squatter	
515	Simri Bakhtiyarpur (Purani Bazar)	Simri Bakhtiyarpur	27+200-27+300	Sunil Kumar Chaudhary	75-100	Semi Perma	Resi+Com	Squatter	SC
516	Bhauara	Simri Bakhtiyarpur	27+400-27+500	Nageswar Sharma	75-100	Permanent	Toilet	Squatter	BPL
517	Bhauara	Simri Bakhtiyarpur	27+500-27+600	Pradeep Kumar	75-100	Semi Perma	Boundary Wall	Squatter	BPL

LIST OF DISPLACED PERSONS (TENANTS)

S.N.	Village name	Name of the Owner	Name of the Occupier	Status of Occupier	Social Category	Vulnerability
1	Mansi (Chak Husaini)	Sada Shiv Prasad	Niraj Kumar	Tenant	OBC	BPL
2	Mansi (Chak Husaini)	Alok Anand	Deepak Kumar	Tenant	OBC	BPL
3	Mansi (Chak Husaini)	Alok Anand	Jaay Kumar	Tenant	OBC	BPL
4	Mansi (Chak Husaini)	Alok Anand	Manish Kumar	Tenant	SC	BPL
5	Mansi (Chak Husaini)	Alok Anand	Tinku Anand	Tenant	OBC	BPL
6	Mansi (Chak Husaini)	Alok Anand	Md Mustakh	Tenant	GEN	BPL
7	Gouspur	Molana Ahtesham	Barkat Ali	Tenant	OBC	BPL
8	Simri Bakhtiyarpur (Purani Bazar)	Hira Bhagat	Shyam Kumar	Tenant	SC	BPL
9	Gouspur	Md Afroj Alam	Md Wali Alam	Tenant	OBC	BPL
10	Gouspur	Md Afroj Alam	Md Asif	Tenant	OBC	BPL
11	Gouspur	Md Afroj Alam	Md Imteyaz Alam	Tenant	OBC	BPL
12	Gouspur	Md Afroj Alam	Quasari Khatun	Tenant	OBC	BPL
13	Gouspur	Md Afroj Alam	Md Sajid Ali	Tenant	OBC	BPL
14	Gouspur	Md Afroj Alam	Shokat Ali	Tenant	OBC	BPL
15	Gouspur	Md Shadab Ali	Ranjan Kumar	Tenant	OBC	BPL
16	Gouspur	Md Shadab Ali	Zeeshan Haider	Tenant	OBC	BPL

APPENDIX 3: LIST OF CPR

S.N.	Name of the Village	Name of Block	Name of District	Chainage Kilometer	Type of Structure		Scale of Impact (In %)	Type of Construction of Structure	Use of Structure
1	Dighari (Bangalia)	Chautham	Khagaria	10+150-10+200	TEMPLE	7.84	75-100	Permanent	Temple
2	Mansi (Khutia)	Mansi	Khagaria	0+400-0+500	TEMPLE	47.88	75-100	Semi Perma	Temple
3	Mansi (Chak Husaini)	Mansi	Khagaria	1+100-1+200	TEMPLE	17.5	75-100	Permanent	Temple
4	Mansi (Chak Husaini)	Mansi	Khagaria	1+100-1+200	TEMPLE	5.58	75-100	Permanent	Temple
5	Mansi (Chak Husaini)	Mansi	Khagaria	1+400-1+500	TEMPLE	17.94	75-100	Permanent	Temple
6	Balha	Mansi	Khagaria	6+000-6+100	TEMPLE	9.6	75-100	Permanent	Temple
7	Gurgawan (Phensaha)	Salakhua	Saharsa	23+700-23+800	TEMPLE	14.62	75-100	Permanent	Temple
8	Gouspur	Salakhua	Saharsa	25+000-25+100	TEMPLE	6.88	0-25	Permanent	Temple
9	Simri Bakhtiyarpur	Simri Bakhtiyarpur	Saharsa	25+900-26+000	BAJRAJ BALI TEMPLE	4	75-100	Permanent	Temple
10	Kopadiya	Salakhua	Saharsa	17+900-18+000	TEMPLE	4.37	75-100	Temp	Temple
11	Simri Bakhtiyarpur	Simri Bakhtiyarpur	Saharsa	25+400+25+500	TEMPLE	21.39	25-50	Permanent	Temple
12	Khirnia	Chautham	Khagaria	6+800-6+900	TEMPLE	9.72	25-50	Semi Perma	Under Const
13	Dhamahara	Chautham	Khagaria	13+100-13+150	SCHOOL	139.4	75-100	Permanent	School
14	Mansi (Chak Hussaini)	Mansi	Khagaria	1+900-2+000	BUS STOP	7.37	0-25	Permanent	Bus Stop
15	Saidpur	Mansi	Khagaria	3+300-3+400	BUS STOP	13.23	25-50	Permanent	Bus Stop

16	Balha	Mansi	Khagaria	5+000-5+100	BUS STOP	9.38	25-50	Permanent	Bus Stop
17	Dhamahara	Chautham	Khagaria	13+000-13+050	SAMUDAYAK BHAWAN	85.56	75-100	Permanent	Centre
18	Dhamahara	Chautham	Khagaria	13+100-13+150	ANGANWARI CENTER	33.37	75-100	Permanent	Aaganwari
19	Buchcha (Dhanchhar)	Chautham	Khagaria	14+350-14+400	SCHOOL	115.2	75-100	Semi Perma	Under Const
20	Mansi (Chak Husaini)	Mansi	Khagaria	1+000-1+100	WARE HOUSE	56.7	0-25	Semi Perma	Godown
21	Saidpur	Mansi	Khagaria	3+300-3+400	VILLAGE GATE	4.34	75-100	Permanent	Gate
22	Buchcha (Dhanchhar)	Chautham	Khagaria	14+350-14+400	SCHOOL	46.97	75-100	Semi Perma	Under Const
23	Gouspur	Salakhua	Saharsa	24+000-24+100	ANGANWARI CENTER	7.7	0-25	Permanent	Aaganwari
24	Gouspur	Salakhua	Saharsa	24+000-24+100	ANGANWARI CENTER	2.89	75-100	Permanent	Toilet
25	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	Saharsa	26+700-26+800	STATUE	3.3	25-50	Permanent	Statue
26	Mansi (Chak Hussaini)	Mansi	Khagaria	1+300-1+400	GOVT. TOILET	16.8	75-100	Permanent	Toilet
27	Mansi (Chak Hussaini)	Mansi	Khagaria	1+300-1+400	GOVT. TOILET	3.9	75-100	Permanent	Toilet
28	Mobarakpur	Salakhua	Saharsa	22+100-22+200	PANCHAYAT BHAWAN	19.2	75-100	Permanent	Panchayat Bhawan
29	Simri Bakhtiyarpur (Azad Nagar)	Simri Bakhtiyarpur	Saharsa	26+800-26+900	NATH BALI TEMPLE	10 BW	75-100		Temple

APPENDIX4: FINDINGS OF CONSULTATIONS

Chainage	Village	Type of village	Tehasil/ Block	District	GPS Coordinates		Date of Consultation	Number of Participants
					Longitude	Latitude		
1+500 - 1+600	Mansi (Chak Husaini)	Semi Urban	Mansi	Khagaria	Longitude: N25°31' 04" Latitude: E86°33'25"		02-01-2022	38
14+200 -14+300	Buchcha	Rural	Chauthan	Khagaria	Longitude: N25°37' 4 ' Latitude: E86°36'69"		03-01-2022	35+63
27+100 - 27+200	Simri Bakhtiyar pur (Purani Bazar)	Semi Urban	Simri Bakhtiyar pur	Saharsa	Longitude: N25°43' 37" Latitude: E86°34'56"		05-01-2022	19+20

Question	General perception about the project and the awareness about the proposed project.	Support of local people for the proposed project.	Any critical issue or concern by the local people regarding the project ?	Any specific measure you would like to see considered during project design, construction and operation stage ?
Village				
Mansi (Chak Husaini)	Most of the villagers are aware about this project. According to them Road condition will improve but fear of accidents due to high speed.	Yes, in support of the proposed project.	Village residential/commercial structure loss should be minimized.	Drainage system and foot path should be at both side of the road.
Buchcha	People are aware and general perception is that the project should implement as soon as possible.	Yes, in support of the proposed project.	Not any critical issue, some of the residential structure need to be relocated.	Road Light and Drainage should be there. There must be water passing passage.
Simri Bakhtiyar pur (Purani Bazar)	Road condition will improve. People are not aware about the project.	Yes, in support of the proposed project.	Village residential/commercial structure loss should be minimized.	Speed breaker, Road Light, foot path and drainage system should be at both side of the road.

Village	Do you have any problem with the existing road?	In your opinion If the road has to be expanded, which side should the expansion take place and why?	What is the Mode of Transport?	How much time you spend for reaching to District HQ?
Mansi (Chak Husaini)	Existing road condition is very poor, it's not enough for the current traffic.	Both side of the existing road.	Bus, Auto, car, two-wheeler etc.	30 Minutes to reach HQ.
Buchcha	Yes, we have huge problem with existing road. It has in very poor condition.	Both side of the existing road. Because it has equal land at both sides.	Bus, Auto, car, two-wheeler etc.	1 Hour and 30 minutes.
Simri Bakhtiyar pur (Purani Bazar)	Existing road condition is not enough for the current traffic. Traffic jam is on regular basis.	Both side of the existing road.	Truck, Tractor, Auto, car etc.	30 Minutes to reach HQ.

Village	How is the Frequency of Public Transport?	Do you sell your agricultural product in the market? If yes, How do you transport them?	Is the proposed project going to reduce accidents and provide better traffic system?	Is it commercially developed area?	Is it an industrial area ?
Mansi (Chak Husaini)	20-30 minutes.	Through truck, tractor and pick-up van etc.	No, it may increase the accident.	No	No
Buchcha	Between 30 to 40 minutes	No, we don't sell our agricultural product in the market because most of the people don't own agricultural land.	Yes, proposed project is going to reduce accident and provide better traffic system.	No	No
Simri Bakhtiyar pur (Purani Bazar)	10 minutes	Through truck, tractor and pick-up van etc.	Yes, proposed project is going to reduce accident and provide better traffic system.	Yes	No

Village	What are the economic activities? Land use, cropping pattern (Seasonal), type of crops etc.?	Current rates for the land per acre	Main source of drinking water	Is there shortage of water for human consumption?
Mansi (Chak Husaini)	Labour and agriculture, 2 Seasonal cropping pattern, Type of crops are Paddy, Maize, Wheat, Tori, Mustard etc.	Rs.2,0000000/Acre	Hand pump	No
Buchcha	Small farming, small business and labor. 2 Seasonal cropping patterns. Type of crops are Paddy, Maize, Wheat, Tori, Mustard etc.	Rs.15000000/Acre	Hand pump	No
Simri Bakhtiyar pur (Purani Bazar)	Small business, Agriculture, labor and services. 2 Seasonal cropping patterns. Type of crops are Paddy, Maize, Wheat, Tori, Mustard etc.	Rs.30000000/Acre	Supply water and Bottled water.	No

Village	Is there any loss of residential/commercial structures due to the project?	Is there any Loss of community life like Market places or community activities to be effected?	Resettlement and Land acquisition (if foreseen due to expansion of road) Has there been land acquisition before?	Availability of Hospitals and over all environment condition. Is there any chronic disease prevalent in this area and are you aware about HIV/AIDS and STD?
Mansi (Chak Husaini)	Yes, residential and commercial structure will be damaged.	Yes, market place will be affected.	No	No, such chronic disease, aware of HIV/AIDS and STD.
Buchcha	Yes, residential and commercial structure will be damaged.	No	No	Yes, we are aware about HIV/ AIDS and STD, but no such disease.
Simri Bakhtiyar pur (Purani Bazar)	Yes, residential and commercial structure will be damaged.	Yes, market area will be affected.	No	No disease, aware of HIV/ AIDS and STD

Village	What are the challenges facing due to Covid -19 in the area?	Poverty Level: Is the area poor or very poor or well off?	Education Status: Literate, illiterate etc	Employment Status: Percentage of employment/ unemployment	Migration pattern (If any), inward or outward
Mansi (Chak Husaini)	Not any challenges facing due to covid - 19	Poor	Literate 60% Illiterate 40%	Unemployed 90% Employed 10%	Outmigration in search of job.
Buchcha	None	Poor	Literate 30% Illiterate 70%	Unemployed 90% Employed 10%	Outmigration.
Simri Bakhtiyar pur (Purani Bazar)	None	Poor	Literate 70% Illiterate 30%	Unemployed 88% Employed 12%	Out migration due to lack of job opportunities.

Village	If the widening of the road necessitates dislocation, where would you like to be relocated ?	What is the possibility of shifting the religious structure(s) if any? And where to relocate?	Preferred option for compensation (Cash or kind)	Perceived benefits from the project
Mansi (Chak Husaini)	Will prefer to relocate in nearby villages.	Depends on land availability	Cash	Easy to reach to the district town, Hospital, College, Land value will increase.
Buchcha	Shift to some other place.	Depends on land availability.	Cash	Easy to reach to the district town, Hospital, School/College. Land value will increase.
Simri Bakhtiyar pur (Purani Bazar)	Depends on availability of land.	Depends on availability of land.	Cash	Easy to reach to the district town, Hospital, College, Land value will increase. More chances of employment.

Village	Perceived Losses from the project	what are the organizations like NGOs/CBOs active in the area?	Is this consultation useful? How?	Likely involvement of local people in the implementation of the project?	What is the tourism potential in the area?	Any other Issues
Mansi (Chak Husaini)	Loss of residential/commercial structure, Chances of accident may will increase.	Rajiv Nasha mukti kendra Activity: Nasha mukt Bihar	Yes, came to know many information.	Yes	Movement of people may increase but, there is no place of tourism in nearby.	None
Buchcha	Loss of agriculture land, residential/commercial structure will damage.	None	Yes, we are able to know more about this project.	Yes	No place of tourism in nearby.	Existing Road is in Poor condition, it is our request to implement this project as soon as possible.
Simri Bakhtiyar pur (Purani Bazar)	Loss of residential/commercial structure, Pollution will increase.	None	Yes, came to know many information about this project.	Yes	No place of tourism in nearby.	None

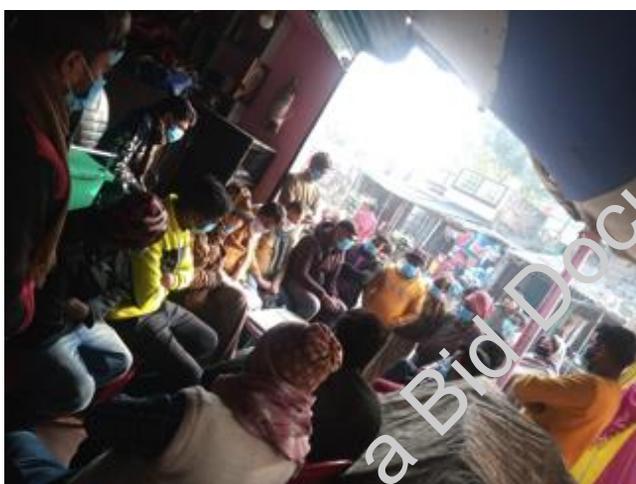
APPENDIX 5: PHOTOGRAPHS AND LIST OF PARTICIPANTS IN FGD ALONG THE ROAD



Consultation at Mansi (Chak Husaini) Village



Consultation at Buchcha and Kirna villages



Consultation at Simri Bakhtiyar pur (Purani Bazar) and Mubarkpur vilages

Village - Mansi (Chak/Husaini)

Bihar State Highway Project-3 (Phase-2)

List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	RAJO DEVI	HOUSEWIFE	60	F	
2	SOBHA DEVI	"	35	F	
3	SUMITRA DEVI	OLD	62	F	
4	KALO DEVI	HOUSEWIFE	50	F	
5	MANJU DEVI	"	35	F	
6	LALITO DEVI	"	45	F	
7	SHANTI DEVI	OLD	60	F	
8	SURITA DEVI	SHOPKEEPER	42	F	
9	GITA DEVI	SHOPKEEPER	42	F	
10	LILA DEVI	LABOUR	45	F	
11	KANCHAN DEVI	"	25	F	
12	SITA DEVI	"	28	F	
13	MEGN DEVI	"	50	F	
14	PHULA DEVI	"	42	F	
15	ASHA DEVI	"	36	F	
16					
17					
18					
19					
20					

Village - Mansi (Chak, Hissarhi)

Bihar State Highway Project-3 (Phase-2)

4. List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	AJIT KUMAR SINGH	BUSINESS & NGO (NAGAR)	52	M	Ajit Singh
2	RAMPKESH SINGH	EX-SERVICE	67	M	Rampkesh Singh
3	RAJEEV KUMAR RAY	FARMER	28	M	Rajeev Kumar
4	UTTAM KUMAR	STUDENT	21	M	Uttam Kumar
5	RUNKANT KUMAR	STUDENT	21	M	Runkant Kumar
6	ASHISH KUMAR	STUDENT	20	M	Ashish Kumar
7	ARUN KUMAR	TEACHER	40	M	Arun Kumar
8	SANJEEV KUMAR	ENG	28	M	Sanjeev Kumar
9	CHANDER BHUSAN	FARMER	36	M	Chander Bhusan
10	ASHOK SINGH	LABOUR	44	M	Ashok Singh
11	RAJESH KUMAR SINGH	SHOPKEEPER	46	M	Rajesh Kumar Singh
12	Subhash Kumar	Businessman	48	M	Subham Kumar
13	Arun Kumar	SHOPKEEPER	42	M	Arun Kumar
14	MUNNILAL SINGH	FARMER	59	M	Munnilal Singh
15	WAKIL SINGH	SHOPKEEPER	46	M	Wakil Singh
16	INDERDEV DAS	BUSINESS	58	M	Inderdev Das
17	RAVI KUMAR	ACCOUNTANCY	46	M	Ravi Kumar
18	SUBHAM KUMAR	STUDENT	15	M	Subham Kumar
19	SUSHIL KUMAR	FARMER	32	M	Sushil Kumar
20	PINTU KUMAR	BUSINESS	40	M	Pintu Kumar
21	BINOD KUMAR	FARMER	55	M	Binod Kumar

village - Mansi (Chak Hussein)

Bihar State Highway Project-3 (Phase-2)

S.L.	Name	Profession	Age	Sex	Signature
22	HANUJ KUMAR	LABOUR	42	M	Mansu Kumar
23	HANU SINGH	LABOUR	62	M	हिंदू सिंह
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					

village - Bucheha

Bihar State Highway Project-3 (Phase-2)

4. List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	UPENDER SINGH	EX-MUKHIYA	58	M	उपेंद्र सिंह
2	JAY PRAKASH SINGH	FARMER	71	M	जयप्रकाश सिंह
3	TIRVEDI SINGH	"	72	M	तिरुवेदी सिंह
4	SANJAY SINGH	"	40	M	संजय सिंह
5	SANJAY SINGH	"	45	M	संजय सिंह
6	PANKAJ SINGH	"	33	M	पंकज सिंह
7	SAHDEV SINGH	LABOUR	40	M	
8	SAJENDER KUMAR	"	62	M	साजेंद्र कुमार
9	PANDEY KUMAR	FARMER	30	M	पंडेय कुमार
10	SULENA DEVI	LABOUR	45	F	
11	PHULESHAR SINGH	SHOP KEEPER	58	M	फुलेश्वर सिंह
12	JAIKISHOR SINGH	LABOUR	45	M	जयकिशोर सिंह
13	JAIWANTI DEVI	"	60	F	
14	GUNA DEVI	OLD	68	F	
15	RAMBILAS THAKUR	FARMER	62	M	
16	LALU SINGH	"	65	M	लालू सिंह
17	MANGAL SINGH	LABOUR	30	M	मंगल सिंह
18	KRISHAN DEVI SINGH	"	55	M	कृशान देवी सिंह
19	MUNNA KUMAR SINGH	"	34	M	Munnakumar Singh
20	RAMBAHADUR SINGH	FARMER	48	M	रामबाहदुर सिंह
21	BUDDHU SINGH	"	60	M	बुद्धू सिंह

village - Buchcha

Bihar State Highway Project-3 (Phase-2)

S.L.	Name	Profession	Age	Sex	Signature
22	RAJENDER SINGH	FARMER	40	M	
23	UMESH SINGH	"	60	M	उमेश सिंह
24	NAWAB SINGH	"	34	M	नवाब सिंह
25	JAYANT KUMAR	STUDENT	16	M	JAYANTK
26	SAJAN KUMAR SINGH	LABOUR	22	M	साजन कुमार
27	BHUSAN SINGH	FARMER	46	M	भुषण सिंह
28	RAGHUVAN SINGH	"	45	M	रघुवंश सिंह
29	SAKAL DEO SINGH	Mechanic	45	M	सकल देव सिंह
30	RAJESH KUMAR	STUDENT	23	M	Rajesh Kumar
31	PAPPU SINGH	FARMER	43	M	पप्पू सिंह
32	SARVODAY KUMAR HIMANSHU	"	34	M	सर्वोदय कुमार
33	WAKIL SINGH	"	52	M	वकील सिंह
34	MANOJ KUMAR	AI ARTIST	40	M	Manoj Kumar
35	PRAMOD SINGH	FARMER	44	M	प्रमोद सिंह

village. Rkhimia

Bihar State Highway Project-3 (Phase-2)

4. List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	SAHEDA KHATUN	HOUSEWIFE	60	F	
2	MANJUL DEVI	LABOUR	40	F	मानजुल देवी
3	SUKHO DEVI	HOUSEWIFE	40	F	
4	BIMALA DEVI	LABOUR	SD	F	
5	POONAM DEVI	LABOUR	35	F	पूनाम देवी
6	MANJULA DEVI	LABOUR	60	F	
7					
8	SABITA DEVI	LABOUR	50	F	
9					
10	LAXMI DEVI	HOUSEWIFE	50	F	
11	NILAM DEVI	HOUSEWIFE	40	F	नीलम देवी
12	VILASHI DEVI	LABOUR	35	F	
13	PINKI DEVI	HOUSEWIFE	27	F	पिंकी देवी
14	PRAMILA DEVI	HOUSEWIFE	60	F	
15	VIMALA DEVI	HOUSEWIFE	50	F	
16					
17	MINA DEVI	HOUSEWIFE	60	F	
18	SIMA DEVI	HOUSEWIFE	27	F	सिमा देवी
19	NIRO DEVI	HOUSEWIFE	50	F	
20	SA.				
21					

Village- Khirmia

Bihar State Highway Project-3 (Phase-2)

List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	MATHNI DEVI	LABOUR	60	F	
2	RANI DEVI	"	27	F	रानी देवी
3	PREMLATA DEVI	"	26	F	प्रेमलता देवी
4	NEELAM DEVI	"	30	F	नीलम देवी
5	GUNJAN DEVI	"	28	F	गुंजन देवी
6	GANITA DEVI	"	30	F	गणित देवी
7	ARUNA DEVI	"	38	F	
8	NANDNI DEVI	OLD AGE	60	F	
9	NITU DEVI	HOUSE WIFE	28	F	नीतु देवी
10	DHURA DEVI	LABOUR	32	F	
11	NEELAM DEVI	"	28	F	नीलम देवी
12	GURIYA DEVI	"	27	F	गुरिया देवी
13	SATI DEVI	"	30	F	सती देवी
14	BIMLA DEVI	"	40	F	
15	SONI DEVI	"	30	F	
16	SIRONANI DEVI	"	45	F	सिरोनी देवी
17	SHABILA KHATOON	OLD	60	F	
18					
19					
20					

village- Lakshmi.

Bihar State Highway Project-3 (Phase-2)

List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	BUKO DEVI	LABOUR	36	F	
2					
3	SASDA KHTOON	HOUSE WIFE	50	F	
4					
5	SONI DEVI	LABOUR	30	F	सोनी देवी
6					
7	SIROHANI DEVI	LABOUR	55	F	
8					
9	ADRA DEVI	OLD	60	F	
10					
11	SATO DEVI	LABOUR	50	F	
12					
13	REKH DEVI	LABOUR	35	F	रेख देवी
14					
15	MAND DEVI	LABOUR	60	F	
16					
17	BHAGWATI DEVI	LABOUR	75	F	
18					
19	SUBHEN DEVI	LABOUR	50	F	
20	RAVEENA DEVI	HOUSE WIFE	25	F	

village- Khirmia

Bihar State Highway Project-3 (Phase-2)

List of Participants

S.L	Name	Profession	Age	Sex	Signature
1	BHAGWANTI	LABOUR	60	F	
2	SEEMA DEVI	HOUSE WIFE	28	F	सिमा देवी
3	ARULA DEVI	OLD AGE	62	F	
4	PHULO DEVI	..	60	F	
5	PUNAM DEVI	HOUSE WIFE	28	F	
6	PARTIBHA DEVI	LABOUR	25	F	पतिभा देवी
7	PRIYANK DEVI	HOUSEWIFE	22	F	प्रियंका देवी
8	BINDU DEVI	LABOUR	30	F	
9	RITA DEVI	..	30	F	
10	JHUNA DEVI		30	F	जुना देवी
11	BESNI DEVI	LABOUR	28	F	
12	GITA DEVI	OLD	63	F	
13					
14	KANCHAN DEVI	LABOUR	35	F	कान्छन देवी
15	TARA DEVI	..	56	F	
16	BIMLA DEVI	OLD	60	F	
17	NIRDHAN DEVI	..	50	F	
18	USHA DEVI	LABOUR	35	F	
19	REBHA DEVI	..	40	F	
20	BIMAL DEVI	..	50	F	

Village- Simri Bakhtiyarpur (Purni Bazar)

Bihar State Highways Project -3 (Phase-2)

List of Participants

S.no.	Name	Profession	Age	Sex	Sign
1	SUNIL KUMAR JAINAL	BUSINESS	55	M	Sunil Kumar
2	VIVEK RANJAN	STUDENT	25	M	Vivek Ranjan
3	RAJESH KUMAR	BUSINESS	34	M	Rajesh Kumar
4	SHAYAM KUMAR	"	24	M	Shyam Kumar
5	RASA KUMAR	STUDENT	26	M	Raja Kumar
6	GAURI SHANKAR SAH	BUSINESS	51	M	G S Sah
7	MUKESH KUMAR JAINAL	VENDER	34	M	Mukesh Kumar Jainal
8	SULIHAN KUMAR	STUDENT	22	M	Sulihhan Kumar
9	RAJ KUMAR MODI	BUSINESS	46	M	RK Modi
10	HIRA KUMAR	FARMER	34	M	Hira Kumar
11	RAMA SHANKAR BHAGAT	BUSINESS	60	M	Rama Shankar Bhagat
12	RAJU KUMAR	STUDENT	26	M	Raju Kumar
13	SIMPAL KUMAR	"	23	M	Simpal Kumar
14	PERWEZ ALAM	BUSINESS	37	M	Perwez Alam
16	SONU KUMAR	STUDENT	21	M	Sonu Kumar
17	SAKALDEEP SAWANKAR	BUSINESS	38	M	Sakaldeep Sawankar
18	SURUDEV KUMAR	SHOPKEEPER	25	M	Surudev Kumar
19	GAURI SHANKAR PANDEY	BUSINESS	65	M	G S Pandey

village- Mobarakpur

Bihar State Highway Project-3 (Phase-2)

List of Participants

S.L.	Name	Profession	Age	Sex	Signature
1	PINKI DEVI	LABOUR	25	F	पिंकी देवी
2	CHANDA KUMARI	"	23	F	चंदा देवी
3	SUGIA DEVI	"	40	F	
4	SUDHA DEVI	"	42	F	
5	MANA DEVI	"	26	F	
6	BIBAH DEVI	"	31	F	बिबा देवी
7	MEERA DEVI	"	45	F	मीरा देवी
8	CHEDNI DEVI	"	35	F	
9	MANCHAN DEVI	"	25	F	
10	SUNITA DEVI	"	35	F	
11	MEGNA DEVI	"	35	F	
12	SHANTI DEVI	"	45	F	
13	INDU DEVI	"	25	F	इन्दु देवी
14	SOBHA DEVI	"	50	F	शोभा देवी
15	CHANDANIYA DEVI	"	30	F	
16	NISHA DEVI	"	32	F	
17	ANITA DEVI	"	60	F	
18	DAYRANI DEVI	"	45	F	
19	GITA DEVI	"	50	F	
20	BRODANIYA DEVI	OLD	65	F	

APPENDIX 6: TERMS OF REFERENCE (TOR) FOR THE RP IMPLEMENTING AGENCY TO IMPLEMENT THE RESETTLEMENT PLAN (RP) FOR TWO-LANE SH-95

1. Project Background

1. The Bihar State Road Development Corporation Limited (BSRDCL), Government of Bihar is presently implementing Bihar State Highways (BSHP) Project under Asian Development Bank (ADB) assistance to strengthen and rehabilitate the deteriorated state roads and upgrade some newly declared state roads to provide reliable road transport services in the state. BSRDCL is planning for Upgradation of SH-95 (28.08 km) into 2-lane road in Khagaria and Saharsa Districts and requested ADB for financing under project loan modality.

2. This RP for two-lane SH-95 project is prepared based on the detailed design report prepared by BSRDC. As per the RP total private land to be acquired is 67.77 acre and total number of structures affected is about 570, number of households affected is about 665 and number of CPRs is about 29. The RP complies with the applicable State Government, Government of India and ADB policy and legal framework. This project is considered as Category-A28 as per as Involuntary Resettlement (IR) is concerned. BSRDC is implementing the project and an RP implementing agency is required to implement the Resettlement Plan prepared for the project.

3. The RP implementing agency shall be responsible for assisting BSRDCL in implementing resettlement activities for the two-lane SH-95 project. The proposed road traverses along 14 villages of Khagaria and Saharsa districts.

4. The project construction would necessitate clearance of road and displacement and loss of assets, livelihood and community property resources. The displaced households include titleholders losing land and structures and non-titleholders losing assets.

5. The overall implementation period for this assignment is 36 months from the commencement of contract.

6. Objectives of the Assignment

7. The RP implementing agency shall be responsible for assisting BSRDC in facilitating and Resettlement Plan (RP) implementation and assistance in getting the Government land transferred in name of BSRDC in an efficient and transparent manner for the project road. The implementation shall follow The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 and the ADB's Safeguard Policy Statement 2009.

28 According to ADB Safeguard Policy Statement (SPS-2009), Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

8. The overall tasks of the RP implementing agency are to:
1. Coordinate the entire process from start to finish for disseminating assistance to relevant DPs;
 2. Coordinate with, and provide support, where needed, to Revenue officials and other relevant line agencies in expediting the land acquisition and resettlement process;
 3. Implement livelihood and income restoration program;
 4. Disseminate project information to DPs in an ongoing manner;
 5. Assist the DPs in redressing their grievances (through the grievance redress committee set up for the project);
 6. Conduct awareness program for HIV/AIDs, health and hygiene, and human trafficking in affected villages;
 7. Conduct awareness on Road Safety aspect and train the stakeholders with regard to road safety as required/directed by the Project Management and Authority Engineer of the Project.
 8. Collect data and submit progress reports on a monthly and quarterly basis for BSRDC to monitor the progress of RP implementation; and
 9. Any other tasks as assigned by BSRDC.

10. Scope of Work

11. The principal responsibilities of the RP implementing agency will include, but not limited to the following:

1. Administrative Responsibilities of the RP implementing agency

2. The RP implementing agency will work under the direction of the Deputy General Manager (Tech.)/ Project Resettlement Officer or any person authorized by the him. RP implementing agency shall assist BSRDC in carrying out the implementation of the RP for the project road.

3. The RP implementing agency shall assist BSRDC in conducting all public meetings, information campaigns at the commencement and during implementation the road safety information as per the direction of Road safety Expert of Project Management and Authority Engineer of the project and give full information to the affected villages. This includes translating the summarized RP into local language in a form of a Project Information Brochure for disclosure and dissemination to DPs.

4. The RP implementing agency shall submit monthly and quarterly progress report to BSRDC. The report should cover implementation issues, grievances and summary of consultations

5. The RP implementing agency shall assist BSRDC in convening the GRC and keep the records of GRC at PIU and State level.

6. Assist BSRDC in the management of the database of the DPs, and at the end of the assignment, ensure proper handover of all data and information to BSRDC.

7. Responsibilities for Implementation of the RP

26. The agency shall verify the information already contained in the RP and the individual losses of the relevant DPs. They should validate the data provided in the RP and make suitable changes if required and wherever changes are made it should be supported by documentary evidence. The RP implementing agency shall establish rapport with all DPs, consult and provide information to them about the respective entitlements as proposed under the RP, and distribute entitlement cum Identity Cards to the eligible DPs. The identity card should include a photograph of the DP, the extent of loss suffered due to the project, and the choice of the DP with regard to the mode of compensation and assistance.

1. The RP implementing agency shall develop rapport between the DPs and the Project Authority. This will be achieved through regular meetings with both the PIU and the DPs. Meetings with the PIU will be held at least fortnightly, and meetings with the DPs will be held monthly, during the entire duration of the assignment. All meetings and decisions taken shall be documented by the RP implementing agency.

2. The RP implementing agency shall display the list of eligible DPs in prominent public places like villages, Panchayat Offices, Block/Tehsil headquarters, and the District Headquarters.

3. During the verification of the eligible DPs, the RP implementing agency shall ensure that each of the DPs are contacted and consulted either in groups or individually. The agency shall specially ensure consultation with women from the DP families especially women headed households.

4. Participatory methods should be adopted in assessing the needs of the DPs, especially with regard to the vulnerable groups of DPs. The methods of contact may include village level meetings, gender participation through group's interactions, and Individual meetings and interactions.

5. The RP implementing agency shall explain to the DPs the provisions of the policy and the entitlements under the RP. This shall include communication to the roadside squatters and encroachers about the need for their eviction, the timeframe for their removal and their entitlements.

6. The RP implementing agency shall disseminate information to the DPs on the possible consequences of the project on the communities' livelihood systems and the options available, so that they do not remain ignorant.

7. In all of these, the RP implementing agency shall consider women as a special focus group, and deal with them with care and sympathy.

8. The RP implementing agency shall assist the project authorities in ensuring a smooth transition (during the part or full relocation of the DPs), helping the DPs to take salvaged materials and shift. In close consultation with the DPs, the RP implementing agency shall inform PIU about the shifting dates agreed with the DPs in writing and the arrangements desired by the DPs with respect to their entitlements.

9. The RP implementing agency shall assist the DPs in opening bank accounts explaining the implications, the rules and the obligations of a bank account and how s/he can access the resources s/he is entitled to. The RP implementing agency shall recommend methods of disbursement for assistance to

BSRDC for approval. The disbursement method should be transparent, efficient and meets government audit requirements.

10. The RP implementing agency shall prepare a micro plan based on its verification and socio-economic survey and implement the livelihood restoration program for those DPs who qualify for the same. The RP implementing agency shall coordinate with relevant organization or mobilize its own short-term experts in carrying out the training activities.

11. The RP implementing agency shall ensure proper utilisation of the R&R budget available for the subproject. The RP implementing agency shall counsel the DPs in finding suitable economic investment options and help them in regaining the losses of land and other productive assets.

12. Accompanying and Representing the DPs at the Grievance Committee Meetings

13. The RP implementing agency shall nominate a suitable person (from the staff of the RP implementing agency) to be a member of the GRCs. The RP implementing agency shall make the DPs aware of the existence of grievance redressal committees (GRCs).

14. The RP implementing agency shall help the DPs in filling the grievance application and also in clearing their doubts about the procedure as well as the context of the GRC award.

15. RP implementing agency/It shall submit a draft resolution with respect to the particular grievance of the DP, suggesting multiple solutions, if possible, and deliberate on the same in the GRC meeting through the RP implementing agency representative in the GRC.

16. To accompany the DPs to the GRC meeting on the decided date, help the DP to express his/her grievance in a formal manner if requested by the GRC and again inform the DPs of the decisions taken by the GRC within 3 days of receiving a decision from the GRC.

3. Carry out Public Consultation

17. In addition to counseling and providing information to DPs, the RP implementing agency will carry out periodic and ongoing consultation with DPs and other stakeholders.

18. Assisting the P/O with the Project's Social Responsibilities

19. The RP implementing agency shall assist the BSRDC to implement Road safety awareness, HIV/AIDS awareness measures, basic health and hygiene and trafficking. The RP implementing agency shall coordinate with Project Management and Authority Engineer and relevant organization or mobilize its own short-term experts in carrying out the activities.

4. Monitoring and Reporting

20. The RP implementing agency involved in the implementation of the RP will be required to supply all information, documents to the external monitor.

21. Documentation and Reporting by RP Implementation Agency

22. The RP implementing agency shall submit all of the following reports, brochures and outputs in a format approved by BSRDC.

1. **Inception Report.** To be submitted within two weeks of mobilization which includes work plan for the whole contract period, staffing and personnel deployment plan, and a withdrawal plan at the end of the period of contract.
2. **Project Information Brochure.** Summarize the RP, translate summary and produce Project Information Brochure in local language within 1 month of mobilization. For distribution to all affected households.
3. **Micro plans for relevant Non-titleholders.** Includes issuance of ID cards and other documents. To be completed at an agreed time with BSRDC.
4. **Monthly Progress Reports.** To be submitted to BSRDC at the end of each month. Shall include weekly progress and work charts as against the scheduled timeframe of RP implementation.
5. **Quarterly Progress Reports.** To be submitted to BSRDC at the end of each quarter. Shall include progress on implementation, livelihood restoration program, GRC, HIV/AIDS awareness program, issues and challenges, and etc.
6. **Completion Report** at the end of the contract period summarizing the actions taken during the project, the methods and personnel used to carry out the assignment, and a summary of support/assistance given to the DPs.
7. All other reports/documentation as described in these terms of reference.
8. Record minutes of all meetings.

9. Staffing Schedule

10. The table below details the required staffing structure for the assignment. Key personnel will be evaluated during the proposal evaluation stage. The RP implementing agency is required to submit CVs for the key personnel positions. Non-key personnel will not be evaluated during proposal stage. At least one woman should be included as Field Support Staff.

1. Required Experts

No.	Particulars	No. Positions	Estimated Person-months
Key Personnel			
1.	Team Leader	1	18 (intermittent over 36 months)
2.	Key Professional (A) R&R Expert	2 (one for each revenue district)	24 (intermittent over 36 months)
3.	Key Professional (B) Civil Engineer	2 (one for each revenue district)	6 (intermittent over 36 months)
4.	Key Professional (C)	2 (one for each revenue district)	24 (intermittent over 36 months)

	Social Development Expert	revenue district)	
5.	Key Professional (D)	2 (one for each	18 (intermittent over 36 months)
	Land Acquisition Expert	revenue district)	

Non-key Personnel

6.	Field Support Staff	4 (two for each	24 (intermittent over 36 months)
		revenue district)	
7.	MIS Expert	1	24 (intermittent over 36 months)
8.	Support Staff	6 (one each for each	12 (intermittent over 36 months)
	Amin, Chain-man and field	revenue district)	
	staff		
Total		20	354

2. All staff should be mobilized within 3 days of notice from the project resettlement officer.

3. Key Indicative Tasks per Position

4. The position-based tasks specified for each of the positions is mentioned below. The tasks are indicative and the RP implementing agency needs to propose its own working arrangement as a team based on the overall requirements in the TOR.

No. Particulars

No. Particulars

1. Team Leader Provide overall technical and operational management of RP implementing agency team.
Act as main counterpart when communicating with BSRDC and relevant government agencies.
Draft work plan and ensure work plan is followed.
Ensure deliverables and activities are completed in a timely and transparent fashion.
Review documentation and reports to verify accuracy.
2. Key Professional (A) Responsible for assigned section of alignment
R&R Expert Provide guidance to Field Staff and verify information collected.
Ensure deliverables and activities are completed in a timely and transparent fashion.
Provide support to Grievance Redressal Mechanism
3. Key Professional (B) Responsible for assigned section of alignment.
Civil Engineer Valuation of assets of DPs.
Responsible collecting field level information.
Undertake continued information disclosure and consultation.
4. Key Professional (C) assignment. Responsible for community development and community awareness related
Social Development Expert Road Safety and Highway users psychology understanding. Responsible collecting field level information.
Undertake continued information disclosure and consultation.
5. Key Professional (D) revenue department of the district.
Land Acquisition Expert Preparation of compensation with LA office and facilitating distribution of compensation.
Preparation/distribution of assistance amount.
Responsible for working on field with DPs.
6. Field Support Staff
6. MIS Officer Perform all computer/database related needs for the assignment.

23. Qualification & Experience

24. Qualification and experience requirements for experts are listed below.

Staff**Qualification & Experience**

Staff	Qualification & Experience
Team Leader	<p>Minimum: Post graduate degree in social science or Sociology/ Economics/ Master in Social Work/ Masters in Rural Development, Bachelors of law shall be added qualification</p> <p>10 years of minimum professional experience in R&R implementation.</p> <p>5 years of minimum relevant experience with 3 (three) linear project experience in implementing land acquisition and resettlement and rehabilitation activities. Previous experience in project funded by external donors. Good understanding of land acquisition process and The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013</p>
Key Professional (A)	<p>Minimum: Bachelor's degree in Social Science (Sociology/Social work/Anthropology/Geography/Economics). Post graduate degree in social science is preferred</p>
R&R Expert	<p>10 years of minimum professional experience</p> <p>5 years of minimum relevant experience in at least 3 linear project implementing land acquisition and resettlement and rehabilitation activities. Previous experience in project funded by external donors strongly preferred. Good understanding of land acquisition process and The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Proficient in local language preferred.</p>
Key Professional (B)	<p>Minimum: Bachelor's degree in Civil Engineering. 3 years of minimum professional experience with experience in valuation of land asset/building, preparation of estimate. Knowledge of LA act is essential particularly the estimate preparation.</p>
Civil Engineer	<p>Previous experience in working rural communities required. Proficiency in local language is required.</p>
Key Professional (C)	<p>Minimum: Bachelor's degree in Social Science (Sociology/Social work/Anthropology/Geography/Economics). Post graduate degree in social science is preferred</p>
Social Development Expert	<p>10 years of minimum professional experience. 5 years of minimum relevant experience in at least 3 linear project in community development and community awareness projects. Previous experience in project funded by external donors strongly preferred. Good understanding of land acquisition process and The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Proficient in local language preferred.</p>
Key Professional (D)	<p>Land Acquisition Expert Should be at least a graduate. S/he should have about 15 years of working experience in the field of land measurement, land records, and, acquisition of land. Should have worked for about 5 years in R&R or rural development projects. S/he should have experience of participatory management. Knowledge of local language is a necessary qualification.</p>
Land Acquisition Expert	
Field Support Staff	<p>The field support professionals should be graduate or equivalent in social sciences. Knowledge of local language and experience of working in the region is essential.</p>
MIS Officer	<p>Minimum: Bachelor's degree in computer application or related fields.</p> <p>3 years of minimum professional experience</p> <p>Proficient in operating computer and Microsoft Word, and Excel. Ability to design and manage database. Proficient in English and local language.</p>

40. Condition of Services

41. The RP implementing agency shall ensure that the RP is implemented in an effective and proper manner. The prime responsibility of the RP implementing agency shall be to ensure that each and every eligible DP receives appropriate and due entitlement (within the Entitlement Framework) and that, at the end of the project R&R services, the eligible DPs have improved (or at least restored) their previous standard of living. Additionally, the RP implementing agency shall help the BSRDC in all other matters deemed to be required to implement the RP in its spirit and entirely including activities involving some financial implications.

42. All documents created, generated or collected during the period of contract, in carrying out the services under this assignment will be the property of the BSRDC. No information gathered or generated during and in carrying out this assignment shall be disclosed by the RP implementing agency without explicit permission of the BSRDC.

43. Data, Services and Facilities to be provided by BSRDC

44. The BSRDC will provide to the RP implementing agency the copies of all relevant documents required for the agency to undertake its work. Documents will include the DPs' Census, the RP, and technical drawings. The BSRDC will assist the RP implementing agency in collaborating with the Supervision Consultants. All facilities required in the performance of the assignment, including office space, office stationery, transportation and accommodation for staff of the RP implementing agency, etc., shall be arranged by the RP implementing agency.

45. Payment Schedule:

46. The following payment milestone is proposed for making the payment to the RP implementing agency. The payment will be made subject to the submission of a certificate from the BSRDC that the targets have been achieved in a satisfactory manner.

Sl. No.	Indicative Payment Milestone	Payment (% of contract Value)
1	On submission and approval of the inception Report complete in all respects	10%
2	On completion of the identification, verification of DPs and initial consultation sessions, and submission of updated data on DPs (Identification and Verification report) and review of the same by the BSRDC.	10%
3	Demarcation of ROW,	5%
4.	On submission and approval of first 30% of the Micro Plans of DPs	5%
5.	Publication of Declaration and Summary of R&R up to Section 19 of LA Act,	5%
8.	Preparation of Compensation sheet and Declaration Award up to Section 22 & 23 of LAAct	5%
9.	On submission and approval of second 30% of the Micro Plans of DPs	5%
9.	On submission and approval of final 40% of the Micro Plans of DPs	5%
7	On completion of distribution of compensation amount to DPs.	20%
8	On completion of the rehabilitation process and implementation of Livelihood and Income Restoration Program, Road Safety Awareness and HIV/AIDS, health and hygiene, and human trafficking in affected villages.	10%
9	On submission of the Final Completion Report	10%
10	On approval of the Final Completion Report	10%
	Total	100%

47. For livelihood restoration Road Safety awareness and HIV/AIDS awareness component, BSRDC will provide additional funding specific for those activities. RP implementing agency will submit cost proposal to BSRDC for approval prior to implementation of specific component. RP implementing agency will be reimbursed based on actual costs.

48. The above remuneration includes all costs related to carrying out the services, including overhead. The service tax or any other tax component shall be reimbursed/ paid to agency on production of documents. The insurance cost will be separate of the total project cost; the client shall be billed for this.

APPENDIX 7: TERMS OF REFERENCE FOR AN EXTERNAL MONITORING AGENCY/EXPERT FOR 2-LANE SH-95 ROAD PROJECT

1. Introduction

1. The Bihar State Road Development Corporation Limited (BSRDCL), Government of Bihar is presently implementing Bihar State Highways (BSHP) Project under Asian Development Bank (ADB) assistance to strengthen and rehabilitate the deteriorated state roads and upgrade some newly declared state roads to provide reliable road transport services in the state. BSRDCL is planning for upgradation of SH-99 (65.360 km) into two-lane road and requested ADB for financing under project loan modality.

2. This RP for two-lane road project is prepared based on the detailed design report prepared by BSRDC. The RP complies with the applicable State Government, Government of India and ADB policy and legal framework. This project is considered as Category-A29 as per as Involuntary Resettlement (IR) is concerned. BSRDC require an independent consultant for external monitoring and reporting of RP implementation for the project.

3. Objectives and Requirements of Monitoring and Evaluation

4. The objectives of monitoring and evaluation are to assess whether the RP is implemented on schedule and within budget and whether the goals and principles of the RP are achieved. Specifically, monitoring and evaluation will focus on the following aspects of the DPs' situation and the resettlement process.

1. Social and economic situation prior to and after resettlement;
2. Timely disbursement of funds;
3. Functioning of the grievance redress mechanism
4. Environmental conditions;
5. Social adaptability after resettlement;
6. Rehabilitation of vulnerable groups
7. Special items related to the vulnerable groups;
8. Condition and quality of land temporarily acquired when it is returned to the original land users;
9. Measures taken to restore affected livelihoods; and,
10. Living conditions and economic status of DPs following resettlement in comparison to the "without project" scenario.

11. Monitoring and evaluation will include (i) the verification or establishment of a socio-economic baseline of the DPs prior to actual land acquisition, physical displacement/relocation, loss of assets or disruption of businesses (as relevant); (ii) verification of internal monitoring data and reports; (iii) the regular monitoring of their {resettlement or displacement/relocation (as relevant)} and adjustment during Project implementation; and (iv) evaluation of their situation for a period of one year after land acquisition or displacement or relocation (as relevant). In addition, qualitative and quantitative evaluation will be made on the sustainability of living conditions of DPs. Investigation will

²⁹According to ADB Safeguard Policy Statement (SPS-2009), Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

include consultations and observations with DPs, IAs, local officials, village leaders, as well as a quantitative sample survey of displaced households. Focus group discussion will be conducted with male and female DPs, and vulnerable groups.

12. If the findings of the EM indicate significant compliance DPs, the EM will work with the EA and PIU to prepare a separate corrective action plan (CAP) in cooperation with the relevant stakeholders, to address pending or new LAR impacts. The EM will monitor and report on the implementation of the CAP.

13. Monitoring Indicators

14. Monitoring will include process, output and outcome indicators. The monitoring framework and formats stipulated in the RP will be adopted. The following general indicators will be covered.

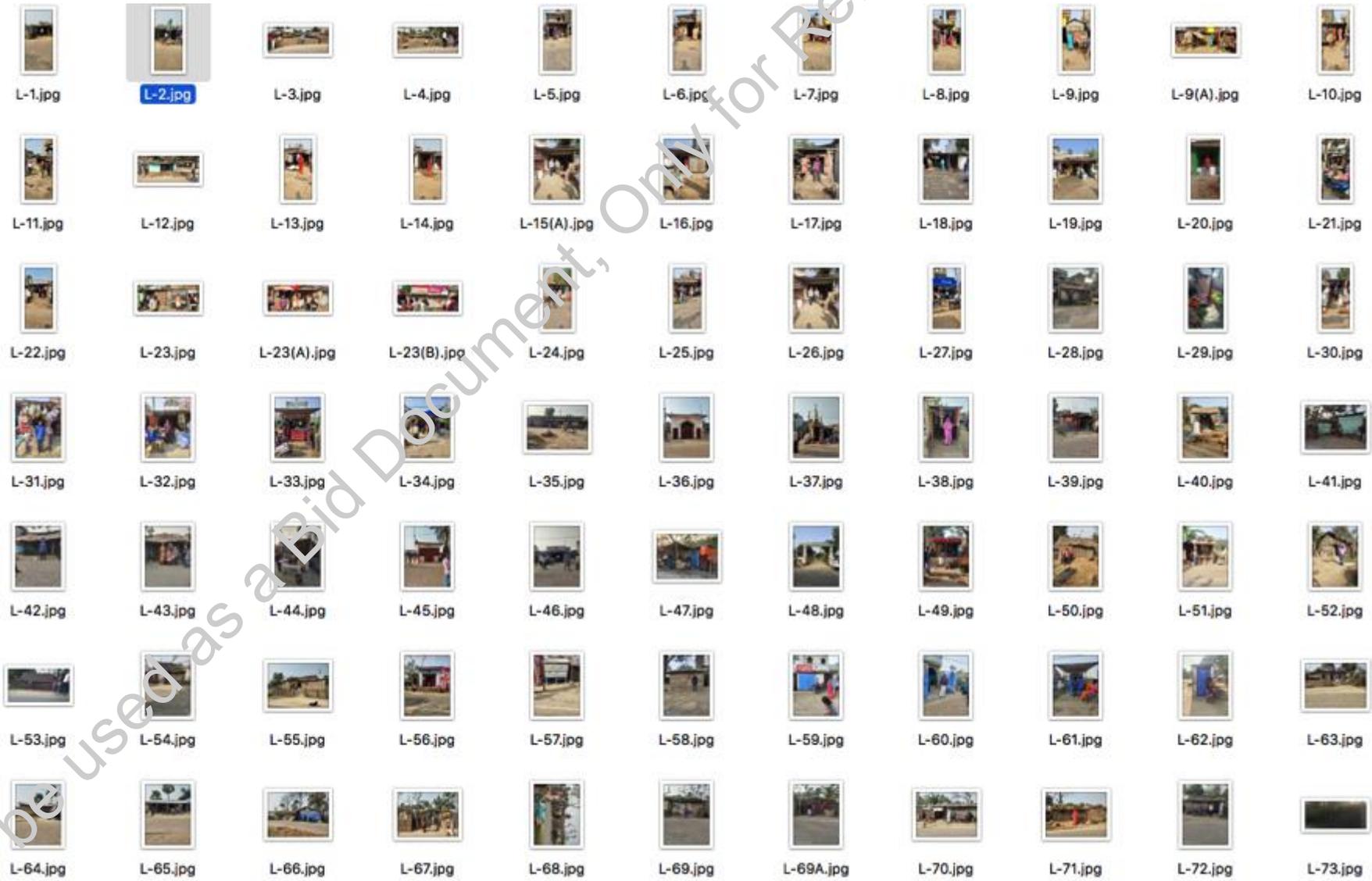
15. Disbursement of entitlements to DPs and enterprises/businesses: compensation, relocation, housing, cultivated farmland, and employment as specified in the RP.
16. Provision of relocation options: the affected persons must move into chosen resettlement/housing option at least one month before physical displacement/relocation; for those opting for self-construction, payment of compensation and provision of housing sites should be completed at least three months before physical displacement/relocation; the compensation for construction of houses should be equivalent to the replacement cost; the DPs must receive their entitlements and allowances on time.
17. Development of economic productivity: re-allocation of cultivated land, land restoration, job opportunities available to DPs, number of DPs employed or unemployed.
18. Standard of living: Throughout the implementation process, the trends in standards of living will be observed and the potential problems in the way of restoration of standards of living will be identified and reported. The Monitor will carry out a comprehensive socio-economic survey after the completion of resettlement implementation to document the standards of living and the conditions of the DPs after resettlement. The survey will be updated annually.
19. Restoration of civic infrastructure: all necessary infrastructure should be restored at the resettlement sites at least up to a standard equal to the standard at the original location; the compensation for all infrastructure should be sufficient to reconstruct it to the same quality.
20. Effectiveness of resettlement planning. Adequacy of assets measurement, entitlements, sufficiency of budget, and timeliness of mitigation measures.
21. Level of satisfaction of DPs: level of satisfaction of DPs with various aspects of the resettlement program; the operation of the mechanisms for grievance redress will be reviewed and the speed and results of grievance redress measures will be monitored.
22. Social adaptability and cohesion: impacts on children, indigenous peoples/ethnic minorities and other vulnerable groups, public participation, DPs' attitudes and reaction to post resettlement situation, number of complaints and appeal procedures, implementation of preferential policies, income restoration measures, and improvements in women's status in villages.
23. Other Impacts. The monitor will verify if there are unintended environmental impacts and impacts on employment and incomes.

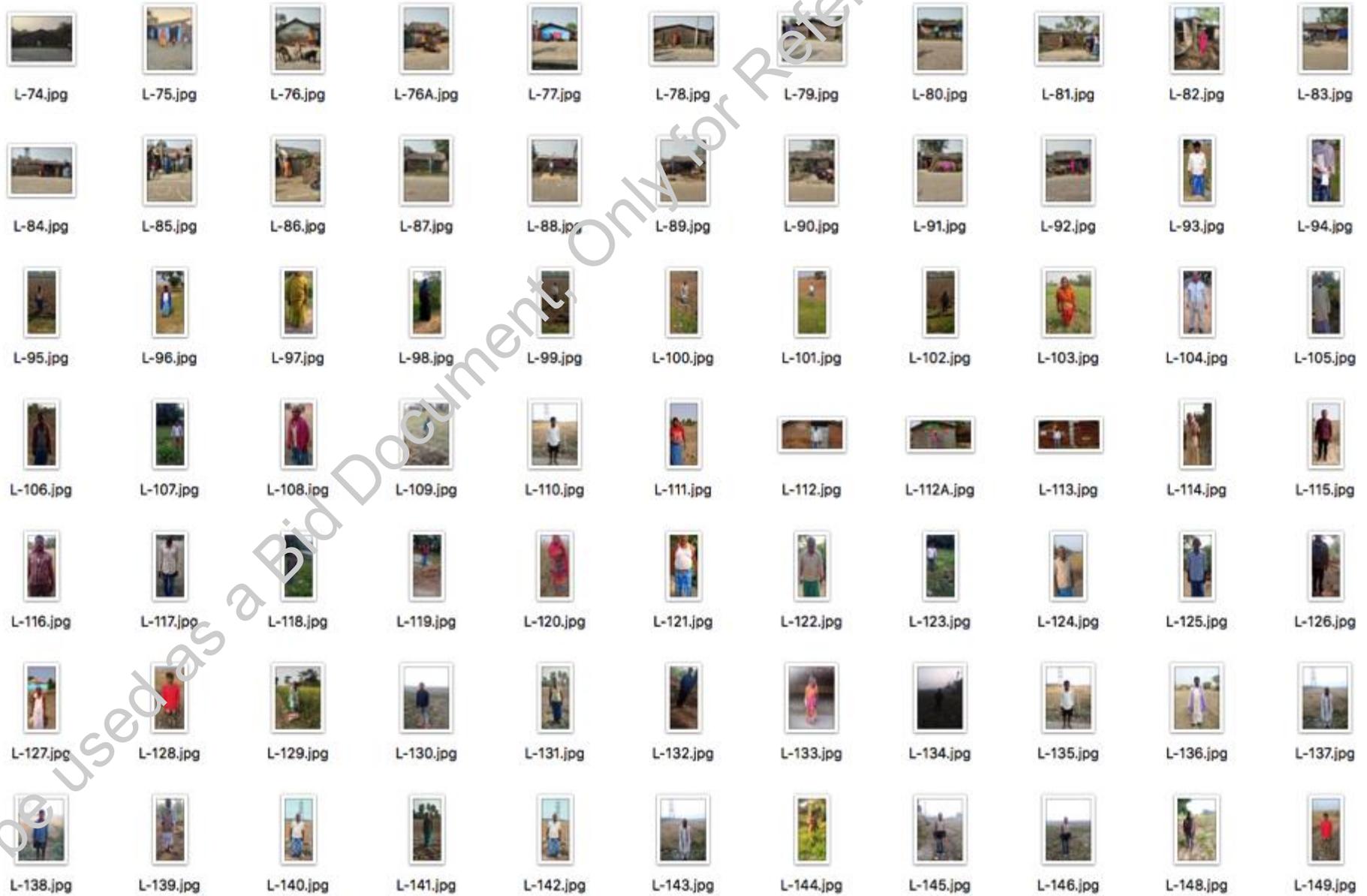
24. Special Considerations

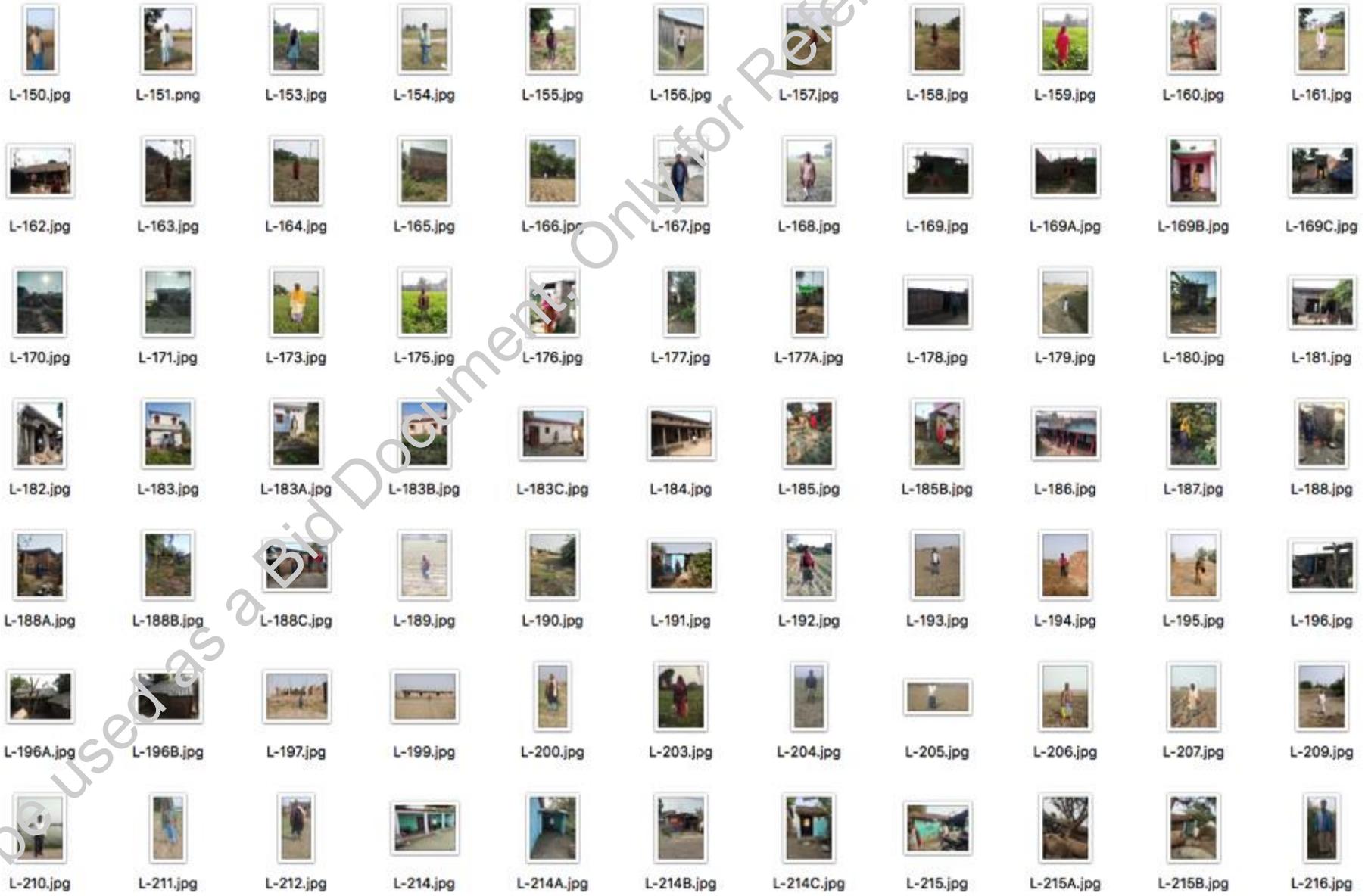
25. Special attention will be paid to women, indigenous peoples/ethnic minorities/groups, as well as the poor and vulnerable groups during monitoring; these include:

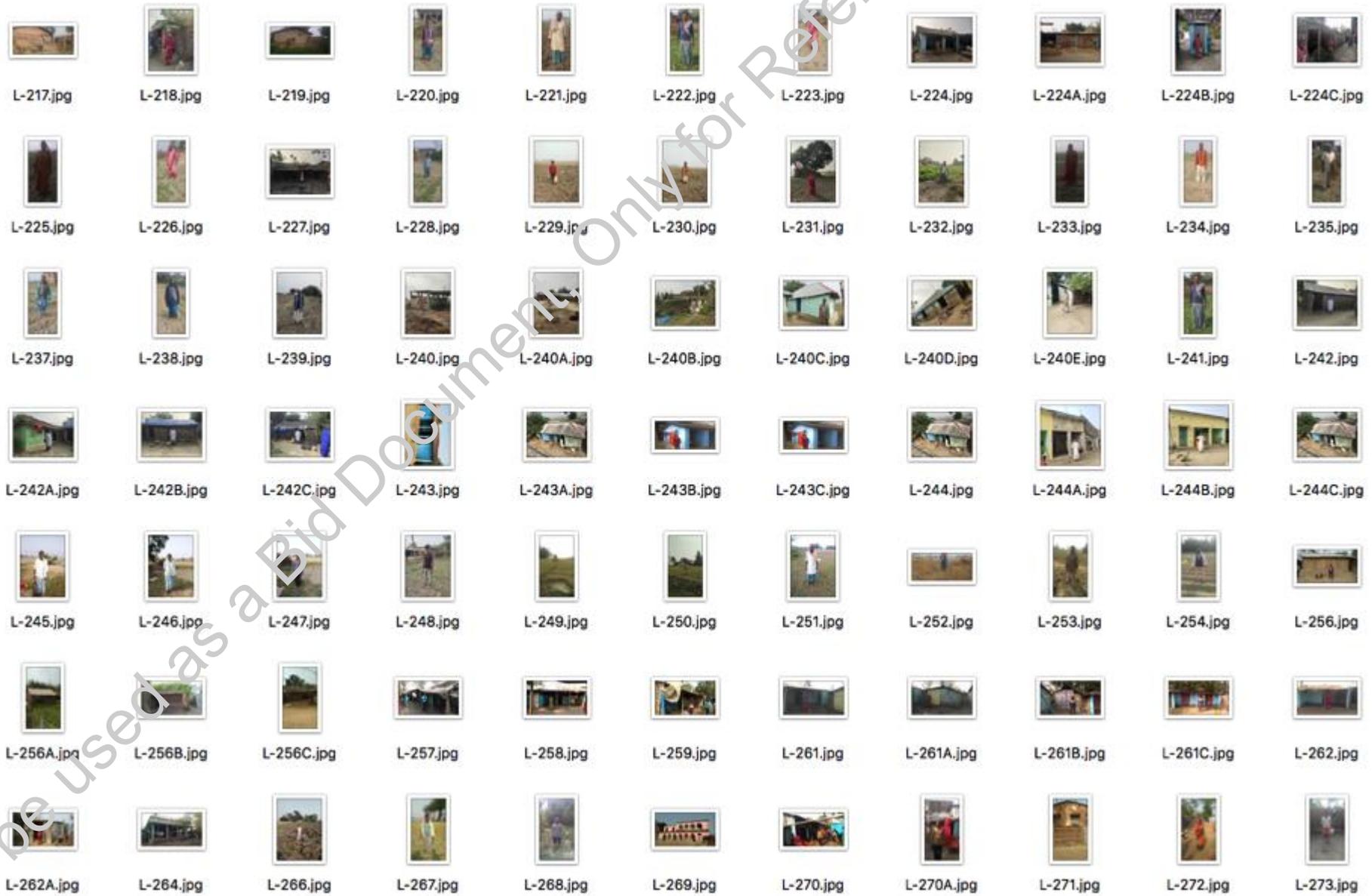
26. The status and roles of women: Closely monitor any change in women's status, function and situations.
27. Differential impacts on indigenous peoples/ethnic minority groups. Closely monitor the socioeconomic status of indigenous peoples to ensure that they have not been further marginalized. Monitoring indicators should to the extent possible be disaggregated by gender and ethnicity.
28. Care and attention to vulnerable groups: Closely monitor living conditions of the poor, the elderly, the handicapped, female headed households and other vulnerable groups after resettlement, to ensure that their livelihood is improved.
29. Monitoring and evaluation will provide information on the utilization and adequacy of resettlement funds.

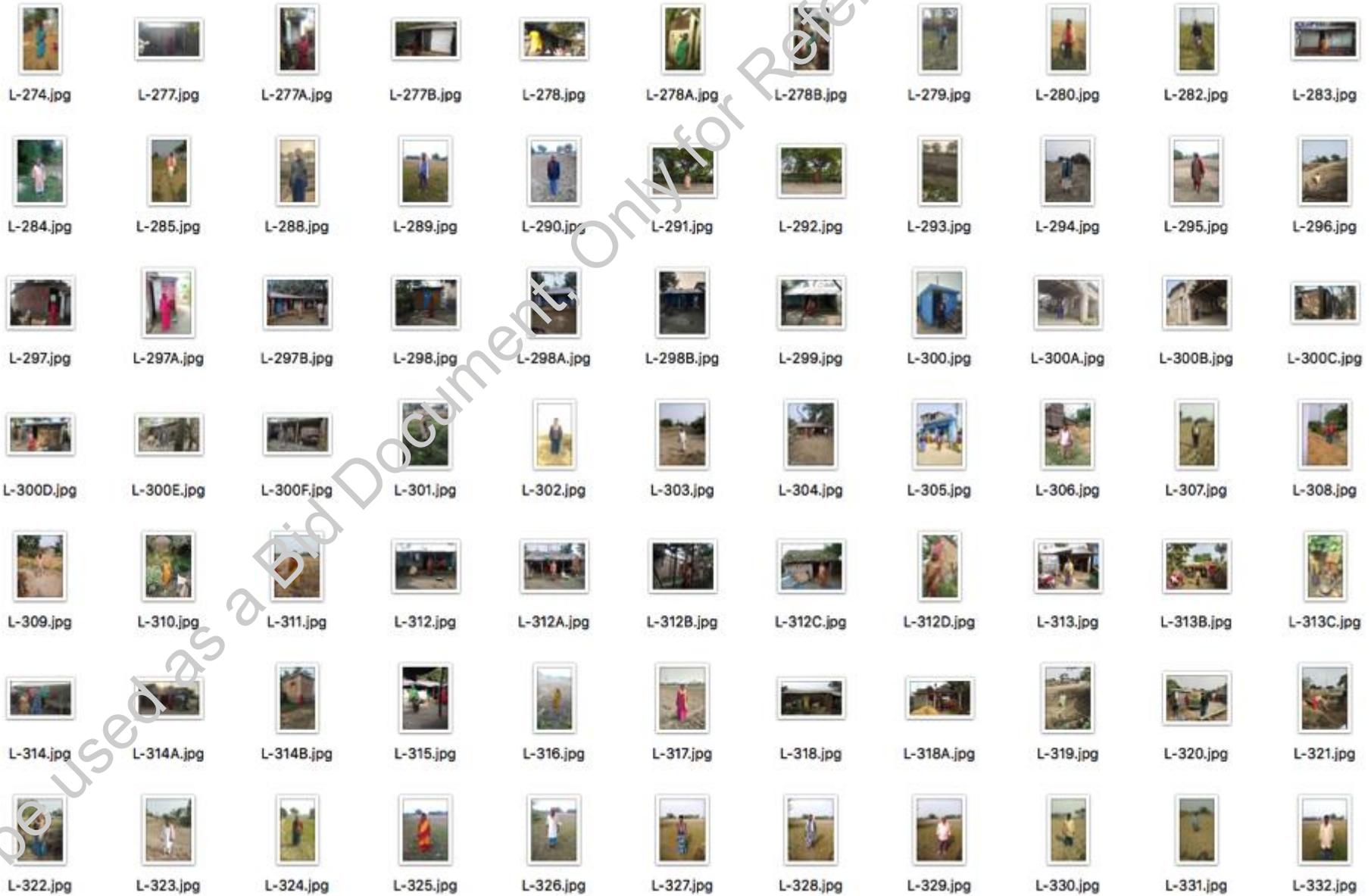
APPENDIX 8: PHOTO IDENTIFICATION OF DISPLACED PERSON

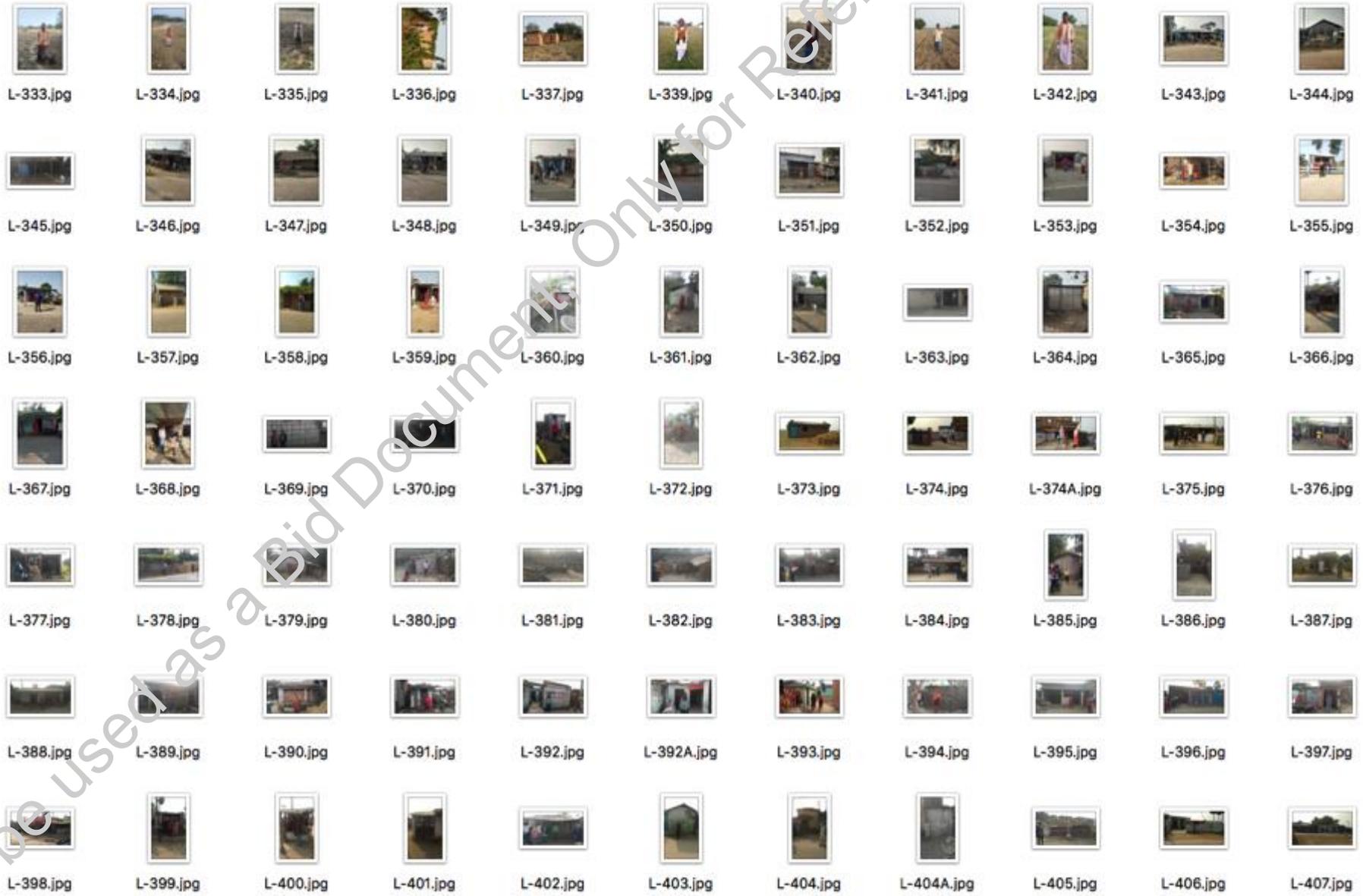


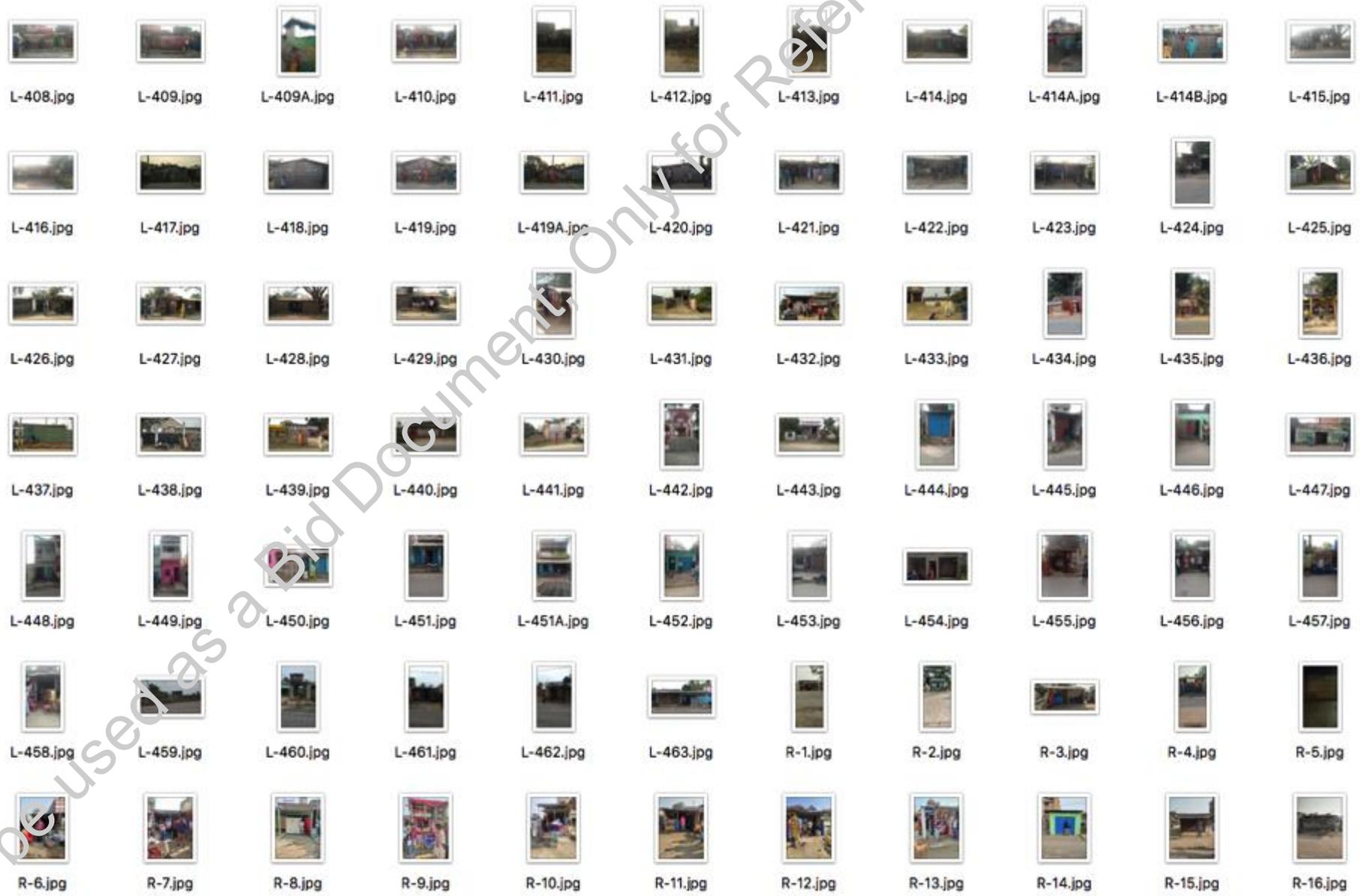


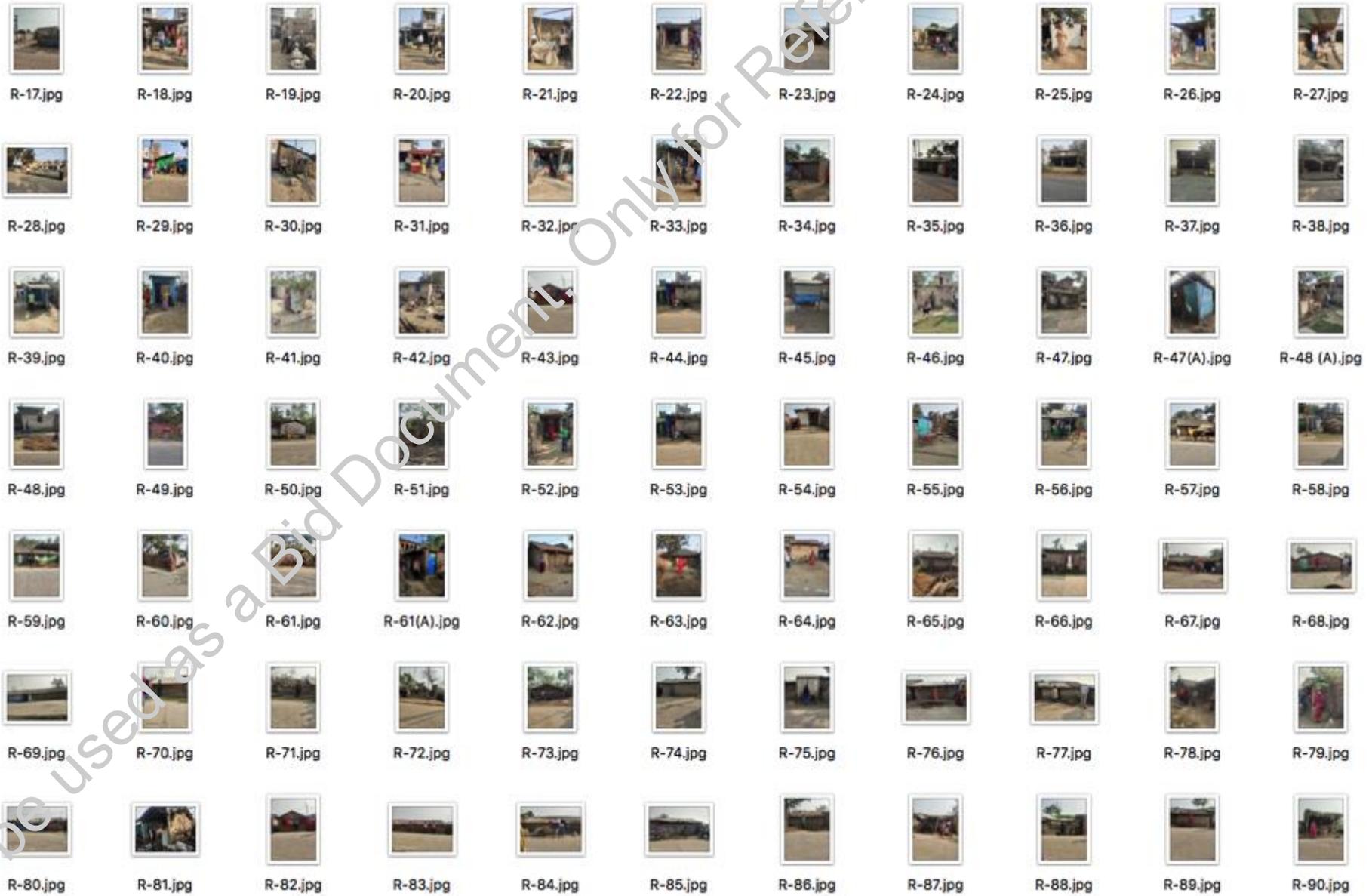


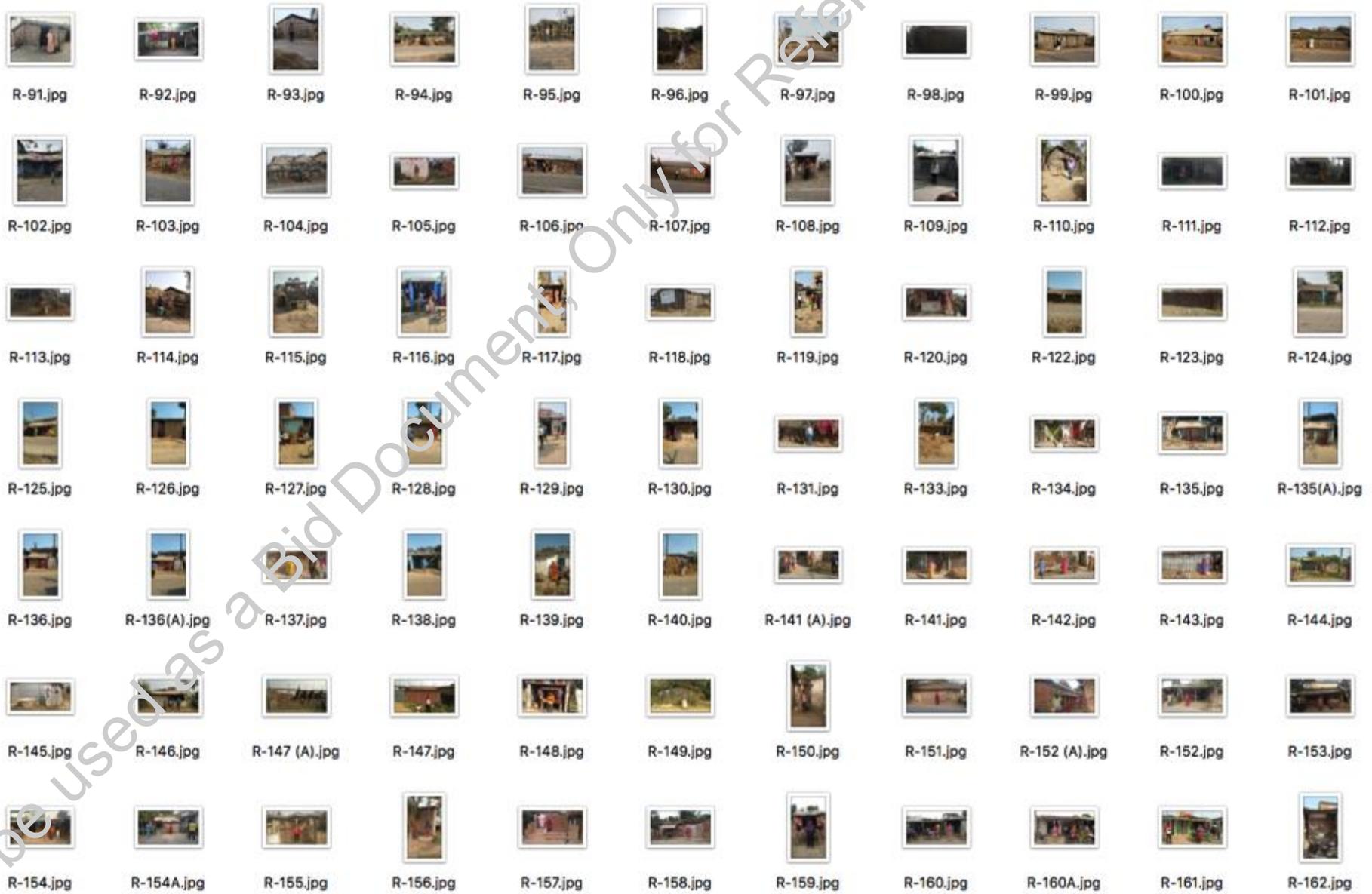


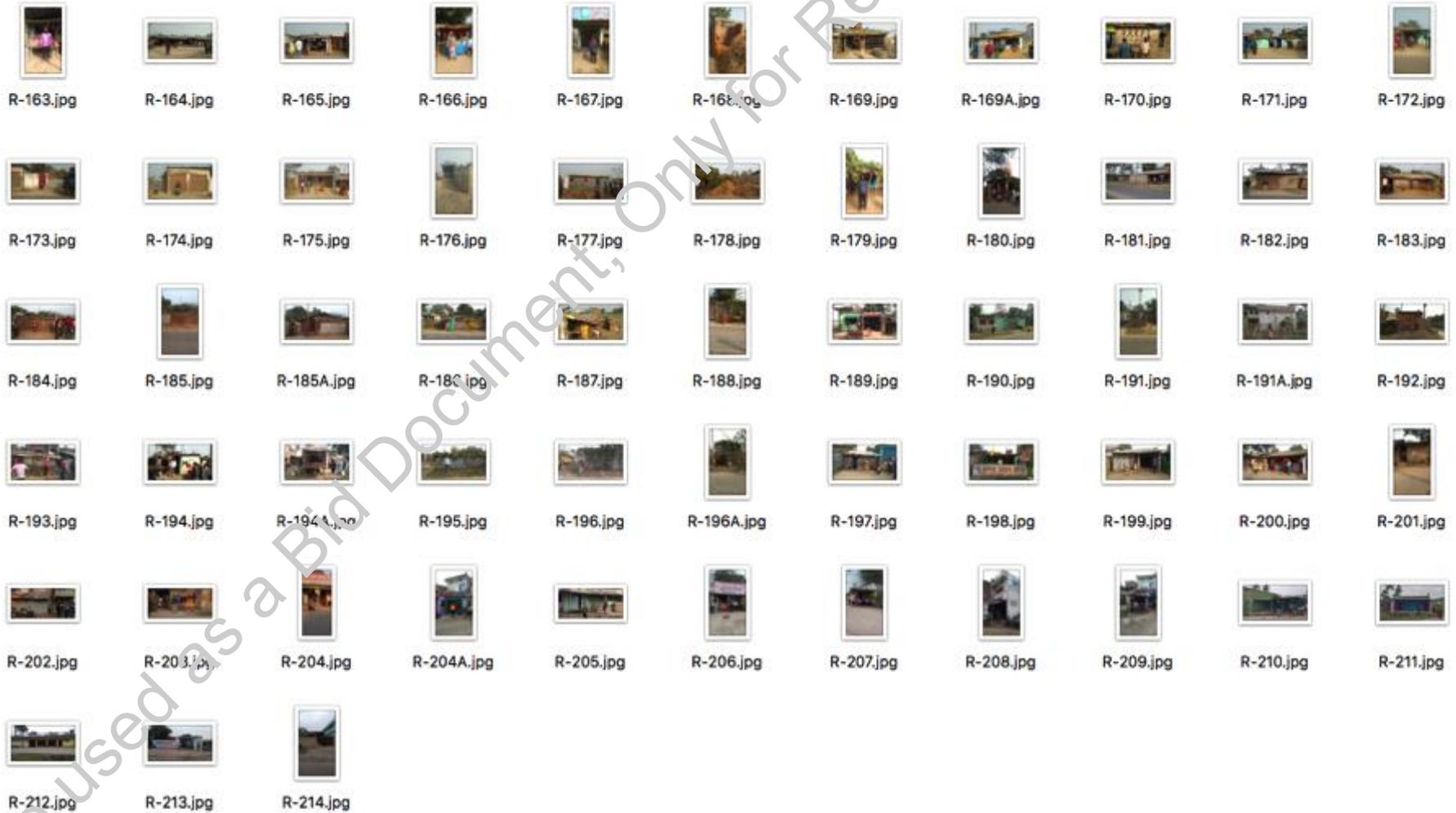












SCHEDULE – E

(See Clauses 2.1 and 14.2)

MAINTENANCE REQUIREMENTS**1 Maintenance Requirements**

- 1.1 The Contractor shall, at all times maintain the Project Highway in accordance with the provisions of this Agreement, Applicable Laws and Applicable Permits. The Contractor shall, at all times maintain and repair the existing carriageway for smooth movement of the traffic from the date of appointment. No separate payment for maintenance and repair of the existing carriageway shall be admissible till the project completion period and will be the part of the Contract Amount.
- 1.2 The Contractor shall repair or rectify any Defect or deficiency set forth in Paragraph 2 of this Schedule-E within the time limit specified therein and any failure in this behalf shall constitute non-fulfilment of the Maintenance obligations by the Contractor. Upon occurrence of any breach hereunder, the Authority shall be entitled to effect reduction in monthly lump sum payment as set forth in Clause 14.6 of this Agreement, without prejudice to the rights of the Authority under this Agreement, including Termination thereof.
- 1.3 All Materials, works and construction operations shall conform to the MORTH Specifications for Road and Bridge Works, and the relevant IRC publications. Where the specifications for a work are not given, Good Industry Practice shall be adopted.

2 Repair/rectification of Defects and deficiencies

The obligations of the Contractor in respect of Maintenance Requirements shall include repair and rectification of the Defects and deficiencies specified in Annex - I of this Schedule-E within the time limit set forth therein.

3. Other Defects and deficiencies

In respect of any Defect or deficiency not specified in Annex - I of this Schedule-E, the Authority's Engineer may, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards, and any deviation or deterioration beyond the permissible limit shall be repaired or rectified by the Contractor within the time limit specified by the Authority's Engineer.

4 Extension of time limit

Notwithstanding anything to the contrary specified in this Schedule-E, if the nature and extent of any Defect or deficiency justifies more time for its repair or rectification than the time specified herein, the Contractor shall be entitled to additional time in conformity with Good Industry Practice. Such additional time shall be determined by the Authority's Engineer and conveyed to the Contractor and the Authority with reasons thereof.

5 Emergency repairs/restoration

Notwithstanding anything to the contrary contained in this Schedule-E, if any Defect, deficiency or deterioration in the Project Highway poses a hazard to safety or risk of damage to property, the Contractor shall promptly take all reasonable measures for eliminating or minimizing such danger.

6 Daily inspection by the Contractor

The Contractor shall, through its engineer, undertake a daily visual inspection of the Project Highway and maintain a record thereof in a register to be kept in such form and manner as the Authority's Engineer may specify. Such record shall be kept in safe custody of the Contractor and shall be open to inspection by the Authority and the Authority's Engineer at any time during office hours.

7. Pre-monsoon inspection / Post-monsoon inspection

The Contractor shall carry out a detailed pre-monsoon inspection of all bridges, culverts and drainage system before 1st June every year in accordance with the guidelines contained in IRC: SP35. Report of this inspection together with details of proposed maintenance works as required on the basis of this inspection shall be sent to the Authority's Engineer before the 10th June every year. The Contractor shall complete the required repairs before the onset of the monsoon and send to the Authority's Engineer a compliance report. Post monsoon inspection shall be done by the 30th September and the inspection report together with details of any damages observed and proposed action to remedy the same shall be sent to the Authority's Engineer.

8. Repairs on account of natural calamities

All damages occurring to the Project Highway on account of a Force Majeure Event or default or neglect of the Authority shall be undertaken by the Authority at its own cost. The Authority may instruct the Contractor to undertake the repairs at the rates agreed between the Parties.

Annexure I

(Schedule-E)

Repair/rectification of Defects and deficiencies

The Contractor shall repair and rectify the Defects and deficiencies specified in this Annex-I of Schedule-E within the time limit set forth in the table below.

Table -1: Maintenance Criteria for Pavements:

Asset Type	Performance Parameter	Level of Services (LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Flexible Pavement (Pavement of MCW, service Road, approaches Asset types of Grade structure, approaches of connecting roads, slip road lay byes etc. as applicable)	Potholes	Nil	<0.1% of area and subject to limit of 10mm in depth	Daily	Length Measurement Unit like Scale, Tape, odometer etc.	IRC 82:2015 and Distress Identification Manual for Long Term Pavement Performance Program, FHWA 2003 (http://www.tfhrcc.com/pavement/lttrreports/03031)	24-48 hours	MORT&H Specification 3004.2

Asset Type	Performance Parameter	Level of Services (LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
	Cracking	Nil	<5% subject to limit of 0.5 sqm for any 50 m length	Daily			7-15 Days	MORT&H Specification 3004.3
	Rutting	Nil	<5 mm	Daily	Straight Edge		15-30 Days	MORT&H Specification 3004.2
	Corrugations and Shoving	Nil	<0.1% of area	Daily	Length Measurement Unit like		2-7 Days	IRC:82-2015
	Bleeding	Nil	<1% of Area	Daily	Scale, Tape, odometer etc.		3-7 Days	MORT&H Specification 3004.4
	Ravelling / Stripping	Nil	<1% of Area	Daily			7-15 Days	IRC:82-2015 read with IRC SP 81
	Edge Deformation/Breaking	Nil	<1 m for any 100 m section and width <0.1 m at any location,	Daily			7-15 Days	IRC:82-2015

Asset Type	Performance Parameter	Level of Services (LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
			restricted to 30 cm from the edge					
	Roughness BI	2000 mm/km	2400 mm/km	Bi-Annually	Class I Profilometer SCRIM (Sideway-force Coefficient Routine Investigation Machine or equivalent)	Class I Profilometer : ASTM E950 {98} : 2004 – Standard Test Method for measuring Longitudinal Profile of travelled surfaces with accelerometer Established Inertial Profiling Reference ASTM E1656 – 94:2000 – Standard Guide for Classification of Automatic Pavement Condition Survey Equipment	180 Days	IRC:82-2015
	Skid Number	60SN	50SN	Bi-Annually			180 Days	BS:7941-1:2006
	Pavement Condition Index	3	2.1	Bi-Annually			180 Days	IRC:82-2015
	Other Pavement Distresses			Bi-Annually			2-7 Days	IRC:82-2015
	Deflection/Remaining Life			Annually	Falling Weight Deflecto meter	IRC115:2014	180 days	IRC:115-2014

Asset Type	Performance Parameter	Level of Services (LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Rigid Pavement (Pavement of MCW, Service Road, Grade structure, approaches of connecting roads, slip roads, lay byes etc. as applicable)	Roughness BI	2200 mm/Km	2400 mm/km	Bi-Annually	Class I Profilometer	ASTM E950(98):2004 and ASTM E1656-94:2000	180 Days	IRC:SP:83-2008
	Skid	Skid Resistance no. at different speed of vehicles		Bi-Annually	SCRIM (Sideway- Force Coefficient Routine Investigation Machine or equivalent)	IRC:SP:83-2008	180 Days	IRC:SP:83-2008
		Minimum SN	Traffic Speed (Km/h)					
		36	50					
		33	65					
		32	80					
		31	95					
		31	110					
Embankment/	Edge drop at	Nil	40mm	Daily	Length Measurement	IRC	7-15 days	MORT&H Specification

Asset Type	Performance Parameter	Level of Services (LOS)		Frequency of Inspection	Tools / Equipment	Standards and References for Inspection and Data Analysis	Time limit for Rectification/ Repair	Maintenance Specifications
		Desirable	Acceptable					
Slope	shoulders				Unit like Scale, Tape, odometer etc.			408.4
	Slope of camber/cross fall	Nil	<2% variation in prescribed slope of camber/cross fall	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Slopes	Nil	<15% variation in prescribe side slope	Daily			7-15 days	MORT&H Specification 408.4
	Embankment Protection	Nil	Nil	Daily		NA	7-15 days	MORT&H Specification
	Rain Cuts/Cullies in slope	Nil	Nil	Daily Specially During Rainy Season		NA	7-15 days	MORT&H Specification

In addition to the above performance criterion, the contractor shall strictly maintain the rigid pavements as per requirements in the following table

Table – 2 : Maintenance Criteria for Rigid Pavements:

S.No.	Type of Distress	Measured Parameter	Degree of Severity	Assessment Rating	Repair Action	
					For the case $d < D/2$	For the case $d > D/2$
CRACKING						
1	Single Discrete Cracks Not intersecting with any joint	W = width of crack L = Length of crack d = depth of crack D = depth of slab	0	Nil, not discernible	No action	Not applicable
			1	W < 0.2 mm. hair cracks		
			2	W = 0.2 – 0.5 mm, discernible from slow – moving car	Seal without delay	Seal and stitch if L > 1m. Within 7 days.
			3	W = 0.5 – 1.5 mm, discernible from fast-moving car		
			4	W = 1.5 – 3.0 mm	Seal, and stitch if L > 1m, within 7 days	Staple or Dowel bar retrofit, FDR for affected portion. Within 15 days.
			5	W > 3mm,		
2	Single	W = width of crack	0	Nil, not discernible	No action	

	Transverse (or Diagonal) Crack intersecting with one or more joints	L = Length of crack d = depth of crack D = depth of slab	1	W < 0.2 mm. hair cracks	Route and seal with epoxy. Within 7 days	Staple or Dowel Bar retrofit. Within 15 days
			2	W = 0.2 – 0.5 mm, discernible from slow vehicle		
			3	W = 0.5 – 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 7 Days	
			4	W = 3.0 – 6.0 mm	Dowel Bar Retrofit. Within 15 days	Full Depth Repair Dismantle and reconstruct affected.
			5	W < 6 mm, usually associated with spalling, and / or slab rocking under traffic	Not Applicable, as it may be full depth	Portion with norms and specifications – see Para 5.5 & 9.2 Within 15 days.
3	Single Longitudinal Crack intersecting	W = width of crack L = Length of crack d = depth of crack	0	Nil, not discernible		
			1	W < 0.5 mm, discernible from slow vehicle	Seal with epoxy, if L > 1m Within 7 days	Staple or dowel bar retrofit. Within 15 Days

	with one or more joints	D = depth of slab	2	W = 0.5 – 3.0 mm, discernible from fast vehicle	Route, seal and stitch, if L > 1 m. Within 15 Days	
			3	W = 3.0 – 6.0 mm	Staple, if L > 1m. Within 15 days	Partial Depth Repair with stapling.
			4	W = 6.0 – 12.0 mm, usually associated with spalling	Not Applicable, as it may be full depth	Within 15 days
			5	W > 12mm, usually associated with spalling and / or slab rocking under traffic		Full Depth Repair Dismantle and reconstruct affected portion as per norms and specifications see Para 5.6.4 Within 15 days
4	Multiple Cracks intersecting with one or more joints	w = width of crack	0	Nil, not discernible	No Action	
			1	W < 0.2 mm. hair cracks	Seal, and stitch if L > 1 m. Within 15 days	
			2	W = 0.2 – 0.5 mm, discernible from slow vehicle		
			3	W = 0.5 – 3.0 mm, discernible from fast vehicle	Full depth repair within 15 days	Dismantle, Reinststate sub

			4	W = 3.0 – 6.0 mm panel broken into 2 or 3 pieces		base, Reconstruct whole slab as per specifications within 30 days
			5	w > 6 mm and / or panel broken into more than 4 pieces		
5	Corner Break	w = width of crack L = length of crack	0	Nil, not discernible	No Action	
			1	w < 0.5mm; only 1 corner broken	Seal with low viscosity epoxy to secure broken parts within 7 days	Seal with epoxy seal with epoxy within 7 days
			2	w < 1.5 mm; L < 0.6 m, only one corner broken		
			3	w < 1.5 mm; L < 0.6 m, only two corner broken	Partial Depth (Refer Figure 8.3 of IRC:SP:83-2008) within 15 days	Full depth repair
			4	w < 1.5 mm; L < 0.6 m, only three corner broken		
			5	Three or four corner broken		
6	Punchout (Applicable Continuous)	w = width of crack L = length (m/m ²)	0	Nil, not discernible		No Action
			1	w < 0.5mm; L < 3 m/m ²		Seal with low

	Reinforced Concrete Pavement (CRCP) only		2	Either $w > 0.5 \text{ mm}$ or $L < 3 \text{ m/m}^2$	Not Applicable, as it may be full depth	viscosity epoxy to secure broken parts. Within 15 days
			3	$w > 1.5 \text{ mm}$ and $L < 3 \text{ m/m}^2$		
			4	$w > 1.5 \text{ mm}$ and $L < 3 \text{ m/m}^2$ and deformation		
			5	$w > 1.5 \text{ mm}$ and $L > 3 \text{ m/m}^2$ and deformation		Full depth repair – Cut out and replace damaged area taking care not to damage reinforcement. Within 30 days.
7	Ravelling or Honeycomb type surface	$r = \text{area damaged surface} / \text{total surface of slab} (\%)$ $h = \text{maximum depth of damage}$	0	Nil, not discernible	Short term	Long Term
					No action	Not Applicable
			1	$r < 2\%$	Local repair of areas damage.	
			2	$r = 2 - 10 \%$	And liable to be damaged. Within 15 days	
			3	$r = 10-25\%$	Bonded Inlay, 2 or 3 slabs if affecting. Within 30 days	
			4	$r = 25.50\%$		

			5	$R > 50\%$ and $h > 25$ mm	Reconstruct slabs, 4 or more slabs if affecting. Within 30 days	
8	Scaling				Short Term	Long Term
			0	Nil, not discernible	No Action.	Not Applicable
			1	$r < 2\%$	Local repair of areas damaged and liable to be damaged.	
			2	$r = 2 - 10 \%$	Within 7 days	
			3	$r = 10-20\%$	Bonded inlay within 15 days	
			4	$r = 20-30\%$		
			5	$R > 30\%$ and $h > 25$ mm	Reconstruct slab within 30 days.	
9	Polished Surface/Glazing	t = Texture depth, sand patch test	0		No Action	
			1	$t > 1$ mm		

			2	t = 1- 0.6 mm	Monitor rate of deterioration	
			3	t = 0.6- 0.3 mm		
			4	t = 0.3- 0.1 mm		
			5	t < 0.1 mm	Diamond Grinding if affecting 50% or more slabs in a continuous stretch of minimum 5 km. Within 30 days	
10	Popout (Small Hole), Pathole Refer Para 8.4	n = Number / m ² d = Diameter h = Maximum depth	0	d < 50 mm; h < 25mm; n < 1 per 5 m ²	No Action	Not Applicable
			1	d = 50 -100 mm; h < 50mm; n < 1 per 5m ²	Partial depth repair 65 mm deep.	
			2	d = 50 -100 mm; h < 50mm; n < 1 per 5 m ²	Within 15 days	
			3	d = 100 -300 mm; h < 100mm; n < 1 per 5 m ²	Partial depth repair 110 mm i.e.	

			4	d = 100 -300 mm; h < 100mm; n < 1 per 5 m ²	10 mm more than the depth of the hole Within 30 days	
			5	d = 300 mm; h < 100mm; n < 1 per 5 m ²	Full depth repair. Within 30 days	
Joint Defects						
11	Joint Seal Defects	Loss or damage J = Length as % total Joint length	0	Difficult to discern.	Short Term No Action.	Long Term Not Applicable
			1	Discernible, L < 25% but of little immediate consequence with regard to ingress of water or trapping incompressible material.	Clean joint, inspect later.	
			3	Notable, L < 25 % insufficient protection against ingress of water and trapping incompressible material.	Clean and reapply sealant in selected locations. Within 7 days.	
			5	Severe; w > 3 mm negligible protection against ingress of water and trapping incompressible materials.	Clean, widen and re Seal the joint. Within 7 days	
12	Spalling of Joints	w = width on either	0	Nil, not discernible	No Action	Not Applicable

		side of the joint L = length of spalled portion (as % joint length)	1	w < 10 mm	Apply low viscosity epoxy resin/ mortar in cracked portion. Within 7 days	
			2	w = 10 – 20 mm, L < 25%		
			3	w = 20 – 40 mm, L >25%	Partial Depth Repair. Within 15 days	
			4	w = 40 – 80 mm, L > 25%	30-50 mm deep, h=w +20% of w, Within 30 days	
			5	w > 80 mm, and L > 25%	50-100 mm deep repair, h=w +20% of w, Within 30 days	
13	Faulting (or Stepping) in Cracks or Joints	f = difference of level	0	Not discernible, < 1 mm	No action	No action
			1	f < 3mm		
			2	f = 3 – 6 mm	Determine cause and observe, take action for diamond grinding	Replace the slab as appropriate. Within 30 days

			3	$f = 6 - 12 \text{ mm}$	Diamond Grinding	
			4	$f = 12-18 \text{ mm}$	Raise sunken slab.	Replace the slab as appropriate. Within 30 days
			5	$f > 18 \text{ mm}$	Strengthen subgrade and sub-base by grouting and raising sunken slab	
14	Blowup or Buckling	h = vertical displacement from normal profile	0	Nil, not discernible	No Action	
			1	$h < 6 \text{ mm}$		
			2	$h = 6 - 12 \text{ mm}$	Install Sign to Warn Traffic Within 7 days	
			3	$h = 12 - 25 \text{ mm}$		
			4	$h > 25 \text{ mm}$	Full Depth Repair. Within 30 days	
			5	Shattered slabs, i.e. 4 or more pieces	Replace broken slabs. Within 30 days	
15	Depression	h = negative vertical displacement from	0	Not discernible, $h < 5\text{mm}$	No Action	Not Applicable
			1	$h = 5-15 \text{ mm}$		

		normal profile L = length	2	h = 15 – 30 mm, Nos. < 20% joints	Install Signs to warn Traffic within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen subgrade. Reinstate pavement at normal level if L < 20 m. Within 30 days	
			5	h > 100 mm		
16	Heave	h = Positive vertical displacement from normal profile. L = length	0	not discernible, h < 5mm	Short Term	Long Term
					No action.	scrabble
			1	h = 5-15 mm	Follow up.	
			2	h = 15 – 30 mm, Nos. < 20% joints	Install Signs to warn Traffic within 7 days	
			3	h = 30 – 50 mm		
			4	h > 50 mm or > 20% joints	Strengthen	

			5	$h > 100 \text{ mm}$	subgrade. Reinstate pavement at normal level if $L < 20 \text{ m}$. Within 30 days	
17	Bump	h = Vertical displacement from normal profile	0	$h < 4 \text{ mm}$	No Action	
			1	$h = 4 - 7 \text{ mm}$	Grind, in case of new construction within 7 days	Construction limit for new construction.
			3	$h = 7 - 15 \text{ mm}$	Grind, in case of ongoing Maintenance Within 15 days	Replace in case of new construction. Within 30 days
			5	$h > 15 \text{ mm}$	Full Depth Repair. Within 30 days	Full Depth Repair. Within 30 days
18	Lane to Shoulder Dropoff	f = difference of level	0	Nil, Not discernible, $< 3 \text{ mm}$	No action	
			1	$f = 3-10 \text{ mm}$	Spot repair of shoulder	
			2	$f = 10 - 25 \text{ mm}$	Within 7 days	

			3	f = 25 – 50 mm	Fill up shoulder within 7 days	For any 100 m stretch reconstruct shoulder, if affecting 25% or more of stretch. Within 30 days
			4	f = 50-75 mm		
			5	f > 75 mm		
19	Pumping	Quantity of fines and water expelled through open joints and cracks Nos.	0	Not discernible	No action	
			1 to 2	Slight/ occasional Nos < 10%	Repair cracks and joints without delay.	Inspect and repair sub-drainage at distressed sections and upstream.
			3 to 4	Appreciable / Frequent 10-25%	Lift or jack slab within 30 days.	
			5	Abundant, crack development > 25%	Repair distressed pavement sections. Strengthen subgrade and sub-base. Replace slab. Within 30 days	
20	Fouling	Ponding on slabs due to blockage of drains	0-2	No discernible problem	No Action	

			3 to 4	Blockages observed in drains, but water flowing	Clean drains etc within 7 days, follow up	Action Required to stop water damaging foundation within 30 days.
			5	Ponding accumulation of water observed	-do-	

Table -3 : Maintenance Criteria for Safety Related items and Other Furniture items:

Asset Type	Performance Parameter	Level of Service (LOS)	frequency of Measurement	Testing Method	Recommended Remedial measures	Time limit for Rectification	Specifications and Standards
Highway	Availability of Safe Sight Distance	As per IRC SP :84-2014, a minimum of safe stopping sight distance shall be available throughout.	Monthly	Manual Measurements with Odometer along with video/image backup	Removal of obstruction within 24 hours, in case of sight line affected by temporary objects such as tree, temporary encroachments. In case of permanent structure of design deficiency: Removal of obstruction/improvement of deficiency at the earliest.		IRC : SP 73-2018.

		Design Speed, kmph	Desirable Minimum Sight Distance (m)	Safe Stopping Sight Distance (m)			Speed Restriction boards and suitable traffic calming measures such as transverse bar marking, blinkers, etc. shall be applied during the period of rectification.	
		100	360	180				
		80	260	130				
Pavement marking	Wear	<70% of marking remaining		Bi-Annually	Visual Assessment as per Annexure-F of IRC : 35-2015	Re-painting	Cat-1 defect- within 24 hours Cat-2 Defect- within 2 month	IRC :35-2015
	Day time Visibility	During expected life Service Time Cement Road-		Monthly	As per Annexure-D of IRC : 35-2015	Re-painting	Cat-1 defect- within 24 hours	IRC :35-2015

		130mcd/ m ² /lux Bituminous Road- 100mcd/m ² /lux				Cat-2 Defect- within 2 month										
	Night Time Visibility	<u>Initial and Minimum Performance for Dry Retro reflectivity during night time:</u>	Bi- Annuall y	As per Annexure-E of IRC :35-2015	Re painting	Cat-1 defect- within 24 hours Cat-2 Defect- within 2 month	IRC :35- 2015									
		<table border="1"> <thead> <tr> <th>Design Speed</th> <th colspan="2">(RL) Retro Reflectivity (mcd/m²/lux)</th> </tr> <tr> <td></td> <th>Initial (7 days)</th> <th>Minimu m Threshol d level (TL) & warranty period required up to 2 years</th> </tr> </thead> <tbody> <tr> <td>Up to 65</td> <td>200</td> <td>80</td> </tr> </tbody> </table>	Design Speed	(RL) Retro Reflectivity (mcd/m ² /lux)			Initial (7 days)	Minimu m Threshol d level (TL) & warranty period required up to 2 years	Up to 65	200	80					
Design Speed	(RL) Retro Reflectivity (mcd/m ² /lux)															
	Initial (7 days)	Minimu m Threshol d level (TL) & warranty period required up to 2 years														
Up to 65	200	80														

		<table border="1"> <tr> <td>65-100</td> <td>250</td> <td>120</td> </tr> <tr> <td>Above</td> <td>350</td> <td>150</td> </tr> <tr> <td>100</td> <td></td> <td></td> </tr> </table> <p><u>Initial and Minimum Performance for Night Visibility under wet condition (retro reflectivity):</u></p>	65-100	250	120	Above	350	150	100						
65-100	250	120													
Above	350	150													
100															
		<p>Initial 7 days Retro reflectivity : 100 mcd/m²/lux</p> <p>Minimum Threshold Level: 50 mcd/m²/lux</p>													
	Skid Resistance	<p>Initial and Minimum performance for skid resistance:</p> <p>Initial (7days): 55BPN</p> <p>Min. Threshold: 44BPN</p> <p>*Noted: shall be considered under urban/city traffic condition encompassing the locations like pedestrian crossings, bus bay, bus stop, cycle track intersection delineation, transverse bar</p>	Bi-Annually	As per Annexure-G of IRC: 35-2015		Within 24 hours	IRC :35-2015								

		markings etc					
Road Signs	Shape and Position	Shape and Position as per IRC:67-2012. Signboard should be clearly visible for the design speed of the section.	Daily	Visual with video/image backup	Improvement of shape, in case if shape is damaged. Relocation as per requirement	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 15 Days in case of Gantry/Cantilever Sign boards	IRC: 67-2012
	Retro reflectivity	As per specifications in IRC: 67-2012	Bi-Annually	Testing of each signboard using Retro Reflectivity measuring Device. In accordance with ASTM D4956-09	Change of signboard	48 hours in case of Mandatory Signs, Cautionary and Informatory Signs (Single and Dual post signs) 1 Month in case of Gantry/cantilever Sign boards	IRC: 67-2012

Kerb	Kerb Height	As per IRC 86: 1983 depending upon type of kerb	Bi – Annually	Use of distance measuring tape	Raising kerb Height	Within 1 Month	RC 86: 1983
	Kerb painting	Functionality: Functioning of Kerb painting as intended	Daily	Visual with video/image backup	Kerb Repainting	Within 7 days	RC 35: 2015
Other Road Furniture	Reflective pavement Markers (Road Studs)	Number and Functionality as per specifications in IRC: SP 84-2014 and IRC: 35-2015, unless specified in Schedule-B.	Daily	Counting	New Installation	Within 2 months	IRC: SP 84-2014, IRC: 35-2015
	Pedestrian Guardrail	<u>Functionality</u> : Functioning of guardrail as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: SP:84-2014
	Traffic Safety Barriers	<u>Functionality</u> : Functioning of Safety Barriers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP: 84-2014, IRC: 119-2015
	End treatment of Traffic Safety barriers	<u>Functionality</u> : Functioning of End Treatment as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP: 84-2014, IRC: 119-2015
	Attenuators	<u>Functionality</u> : Functioning of Attenuators as intended	Daily	Visual with video/image	Rectification	Within 7 days	IRC:SP-2014

				backup			IRC: 119-2015
	Guard Posts and Delineators	<u>Functionality</u> : Functioning of Guard Posts and Delineators as intended	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 79-1981
	Overhead Sign Structure	Overhead sign structure shall be structurally adequate	Daily	Visual with video/image backup	Rectification	Within 15 days	IRC: 67-2012
	Traffic Blinkers	<u>Functionality</u> : Functioning of Traffic Blinkers as intended	Daily	Visual with video/image backup	Rectification	Within 7 days	IRC: SP 84-2014
Highway Lighting System	Highway Lights	<u>Illumination</u> : Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with lux meter	Improvement in Lighting System	24 hours	IRC: SP: 84-2014
		No major failure in the lighting system	Daily	-	Rectification of failure	24 hours	IRC: SP: 84-2014
		No minor failure in the lighting system	Monthly		Rectification of failure	8 hours	IRC: SP 84-2014

	Toll Plaza Canopy Lights	Minimum 40 Lux illumination on the road surface	Daily	The illumination level shall be measured with lux meter	Improvement in Lighting System	24 hours	IRC: SP: 84-2014
		No major/minor failure in the lighting system	Daily		Rectification of failure	8 hours	IRC: SP:84-2014
Trees and Plantation including median plantation	Obstruction in a minimum head-room of 5.5 m above carriageway or obstruction in visibility of road signs	No obstruction due to trees	Monthly	Visual with video/image backup	Removal of trees	Immediate	IRC: SP: 84-2014
	Deterioration in health of trees and bushes	Health of Plantation shall be as per requirement of specifications & instructions issued by Authority from time to time	Daily	Visual with video/image backup	Timely watering and treatment. Or replacement of trees and Bushes.	Within 90 days	IRC: SP-84-2014
	Vegetation affecting sight line and road structures	Sight line shall be free from obstruction by vegetation	Daily	Visual with video/image backup	Removal of Trees	Immediate	IRC: SP: 84-2014
Rest Areas	Cleaning of toilets		Daily			Every 4 hours	

	Defects in electrical, water and sanitary installations		Daily		Rectification	24 hours	
Other Project Facilities and Approach roads	Damage or deterioration in Approach Roads, Pedestrian facilities, truck lay-bys, Bus-bays, bus-shelters, cattle crossings, traffic Aid Post, medical Aid Posts and other works.		Daily		Rectification	15 days	IRC: SP-84-2014

Asset Type	Performance Parameter	Level of Service (LOS)	Frequency of Measurement	Testing Method	Recommended Remedial measures	Time Limit for Rectification	Specification and Standards
Pipe / box / Culverts	Free waterway / unobstructed flow section	85% of culvert normal flow area to available	2 times in a year (before and after rainy season)	Inspection by Bridge engineer as per IRCSP: 35-1990 and recording of depth of silting and area of vegetation.	Cleaning silt up soils and debris in culvert barrel after rainy season, removal of bushes and vegetation, U/s of barrel, under barrel and D/s of barrel before rainy season.	15 days before onset of monsoon and within 30 days after end of rainy season.	IRC 5-2015, IRC SP:40-1993 and IRC SP : 13-2004
	Leak-proof expansion joints if any	No leakage through expansion joints	Bi-Annually	Physical inspection joints as per IRC SP : 35-1990 if any, for leakage strains on walls at joints.	Fixing with sealant suitably	30 days or before onset of rains whichever comes earlier	IRC SP : 40-1993 and IRC SP : 69-2011
	Structurally sound protection works in good	Spalling of concrete not more than 0.25 sq. m	Bi-Annually	Detailed inspection of all components of culvert as per	Repairs to spalling cracking delamination,	15 days	IRC, SP 40-1993 and MORTH Specifications

	condition	Delamination of concrete not more than 0.25 sq. m. Cracks wider than 0.3 mm not more than 1m aggregate length		IRCSP:35-1990 and recording the defects	rusting shall be followed as per IRC:SP:40-1993		clause 2800
		damaged of rough stone apron or bank revetment not more than 5 sqm. damage to solid apron (concrete apron) not more than 1 sqm	2 times in a year. (before and after rainy season)	condition survey as per IRC SP : 35-1990	Repairs to damaged aprons and pitching	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier	IRC:SP 40-1993 and IRC:SP:13-2004.
Bridges including ROBs, VUP, etc. as applicable	Riding quality or user comfort	No pothole in wearing coat on bridge deck	Daily	Visual inspection as per IRC SP :35-1990	Repairs to BC or wearing coat	15 days	MORT&H Specification 2811
Super Structure	Bumps	No bumps at expansion joint	Daily	Visual inspection as per IRC SP :35-	Repairs to BC on either side of expansion joints, profile	15 days	MORT&H Specification 3004.2 & 2811

				1990	correction course on approach slab in case of settlement to approach embankment		
User safety (condition of crash barrier and guard rail)	No damaged or missing stretch of crash barrier or pedestrian hand railing	Daily	Visual inspection and detailed condition survey as per IRC SP :35-1990	Repairs and replacement of safety barriers as the case may be	3 days	IRC: 5-1998, IRC SP:84-2014 and IRC SP :40-1993.	
rusted reinforcement	Not more than 0.25 sq m	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out the repairs to affected concrete portion with	15 days	IRC SP:40-1993 and MORTH Specification 1600.	
Spalling of concrete	Not more than 0.50 sq.m						
Delamination	Not more than 0.50 sq.m						

					epoxy mortar / concrete.		
	Cracks wider than 0.30 mm	Not more than 1 m total length	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	Grouting with epoxy mortar, investigating causes for cracks development and carry out necessary rehabilitation.	48 Hours	IRC SP:40-1993 and MORTH Specification 2800.
	Rainwater seepage through deck slab	Leakage – nil	Quarterly	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	Grouting of deck slab at leakage areas, waterproofing, repairs to drainage spouts	1 months	MORTH specifications 2600 & 2700.
	Deflection due to permanent loads and live loads	Within design limits.	Once in every 10 years for spans more than 40 m	Load test method	Carry out major rehabilitation works on bridge to retain original design loads capacity	6 months	IRC SP:51-1999.
	Vibrations in bridge deck due to moving	Frequency of vibrations shall not be more	Once in every 5 years for spans more than 30m and every 10	Laser displacement sensors or laser	Strengthening of super structure	4 months	AASHTOLRFD Specifications

	trucks	than 5 Hz	years for spans between 15 to 30m	vibro-meters			
	Leakage in Expansion joints	No. damage to elastomeric sealant compound in strip seal expansion joint no leakage of rain water through expansion joint in case of buried and asphalt plug and copper strip joint.	Bi Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	Replace of seal in expansion joint	15 days	MORTH specifications 2600 and IRCSP:40-1993
	Debris and dust in strip seal expansion joint	No dust or debris in expansion joint gap.	Monthly	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	Cleaning of expansion joint gaps thoroughly	3 days	MORTH specifications 2600 and IRCSP:40-1993
	Drainage spouts	No down take pipe missing / broken below	Monthly	Detailed condition survey as per	Cleaning of drainage spouts thoroughly,	3 days	MORTH specifications 2700.

		soffit of the deck slab. No silt debris, clogging of drainage spout collection chamber.		IRC SP:35-1990 using Mobile bridge inspection Unit	Replacement of missing / broken down take pipes with a minimum pipe extension of 500 mm below soffit of slab. Providing sealant around the drainage spout if any leakages observed.		
substructure	Cracks / spalling of concrete / rusted steel	No cracks, spalling of concrete and rusted steel	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	All the corroded reinforcement shall need to be thoroughly cleaned from rusting and applied with anti-corrosive coating before carrying out repairs to substructure by grouting / guniting and micro	30 days	IRC SP:40-1993 and MORTH Specification 2800.

					concreting depending on type of defect noticed		
	Bearing	Delamination of bearing reinforcement not more than 5%, cracking or tearing of rubber not more than 2 locations per side, no rupture of reinforcement or rubber	Bi-Annually	Detailed condition survey as per IRC SP:35-1990 using Mobile bridge inspection Unit	In case of failure of even one bearing on any pier / abutment, all the bearing on that pier / abutment shall be replaced, in order to get uniform load transfer on to bearings.	3 months	MORTH specifications 2810 and IRCSP:40-1993
Foundations	Scouring around foundations	Scouring shall not be lower than maximum scour level for the bridge	Bi-Annually	Condition survey and visual inspection as per IRC SP:35-1990 using Mobile Bridge Inspection Unit. In case of doubt, use Underwater	Suitable protection works around pier / abutment	1 month	IRC SP : 40-1993, IRC 83-2014, MORTH specification 2500

				camera for inspection of deep wells in major Rivers			
	Protection works in good condition	Damaged of rough stone apron or bank revetment not more than 3 sq.m damage to solid apron (concrete apron) not more than 1 sq.m	2 times in a year (before and after rainy season)	Condition survey as per IRC SP:35-1990	Repairs to damaged aprons and pitching.	30 days after defect observation or 2 weeks before onset of rainy season whichever is earlier.	IRC SP : 40-1993, IRC:SP: 13-2004.
<p>Note : Any Structure during the entire contract period which is found that does not complies with all requirements of this Table will be prepared, rehabilitated or even reconstructed under the scope of the contractor.</p>							

Table 5 : Maintenance Criteria for Hill Roads- Deleted

In addition to above, for hill roads the following provisions for maintenance is also to done.

Hill Roads.		
(i)	Damage to Retaining wall / Breast wall	7 (Seven) Days
(ii)	Landslides requiring clearance	12 (twelve) hours
(iii)	Snow requiring clearance	24 (Twenty Four) hours

Note: For all tables 1 to 5 above, latest BIS & IRC standards (even those not indicated herewith) along with MoRTH specifications shall be binding for all maintenance activities

A. Flexible Pavement

Nature of Defect or deficiency		Time limit for repair / rectification
(b) Granular earth shoulders, side slopes, drains and culverts		
(i)	Variation by more than 1 % in the prescribed slope of camber /cross fall (shall not be less than the camber on the main carriageway)	7 (seven) days
(ii)	Edge drop at shoulders exceeding 40 mm	7 (seven) days
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	30 (thirty) days
(iv)	Rain cuts / gullies in slope	7 (seven) days
(v)	Damage to or silting of culverts and side drains	7 (seven) days
(vi)	Desilting of drains in urban/semi- urban areas	24 (Twenty four) hours
(vii)	Railing parapets, crash barriers	7 (seven) days (Restore immediately if causing safety hazard)
(c) Road side furniture including road sign and pavement marking		
(i)	Damage to shape or position, poor visibility or loss of retro-reflectivity	48 (forty eight) hours
(ii)	Painting of km stone, railing parapets, crash barriers	As and when required / once every year
(iii)	Damaged / missing signs road requiring replacement	7 (seven) days
(iv)	Damage to road mark ups	7 (seven) days
(d) Road Lighting		
(i)	Any major failure of the system	24 (twenty four) hours
(ii)	Faults and minor failures	8 (eight) hours
(e) Trees and Plantation		
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	24 (twenty four) hours
(ii)	Removal of fallen trees from carriageway	4 (four) hours
(iii)	Deterioration in health of trees and bushes	Timely watering and treatment
(iv)	Trees and bushes requiring replacement	30 (thirty) days

(v)	Removal of vegetation affecting sight line and road structure	15 (fifteen) days
(f) Rest area		
(i)	Cleaning of toilets	Every 4 (four) hours
(ii)	Defects in electrical, water and sanitary installations	24 (twenty four) hours
(g) [Toll Plaza]		
(h) Other Project Facilities and Approach		
(i)	Damage in approach roads, pedestrian facilities, truck lay-byes, bus-bays, bus-shelters, cattle crossings, [Traffic Acid Posts, Medical Aid Posts] and services roads	15 (Fifteen) Days
(ii)	Damaged vehicles or debris on the road	4 (four) hours
(iii)	Malfunctioning of the mobile crane	4(four) hours
Bridges/ ROB/VUP		
(a) Superstructure		
(i)	Any damage, cracks spalling /scaling Temporary measures Permanent measures	Within 48 (forty eight) hours within 15 (fifteen) days or as specified by the Authority's Engineer
(b) Foundation		
(i)	Scouring and / or cavitation	15 (fifteen) days
(c) Piers, abutments, Return walls and wing walls		
(i)	Cracks and damages including settlement and tilting, spalling, scaling	30 (thirty) days
(d) Bearings (metallic) of bridges		
(i)	Deformation, damage, tilting or shifting of bearings	15 (fifteen) days Greasing of metallic bearings once in a year
(e) Joints		
(i)	Malfunctioning of joint	15 (fifteen) days
(f) Other items		
(i)	Deforming of pads in elastomeric bearings	7 (seven) days
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	3 (three) days
(iii)	Damages or deterioration in kerbs, parapets, handrails and crash barriers	3 (three) days (immediately within 24 hours if posing danger to safety)

(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	7 (seven) days
(v)	Damage to wearing coat	15 (fifteen) days
(vi)	Damage or deterioration in approach slabs, pitching, apron, tones, floor or guide bunds	30 (thirty) days
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	15 (fifteen) days
(g)	Hill Roads- Deleted	
(i)	Damage to retaining wall / breast wall	7 (seven) days
(ii)	Landslides requiring clearance	12(twelve) Hours
(iii)	Snow requiring clearance	24 (twenty four) hours

SCHEDULE - F

(See Clause 4.1.(vii)(a))

APPLICABLE PERMITS

1 Applicable Permits

- (i) The Contractor shall obtain, as required under the Applicable Laws, the following Applicable Permits:
- (a) Permission of the State Government for extraction of boulders from quarry;
 - (b) Permission of Village Panchayats and Pollution Control Board for installation of crushers;
 - (c) License for use of explosives;
 - (d) Permission of the State Government for drawing water from river/reservoir;
 - (e) License from inspector of factories or other competent Authority for setting up batching plant;
 - (f) Clearance of Pollution Control Board for setting up batching plant;
 - (g) Clearance of Village Panchayats and Pollution Control Board for setting up asphalt plant;
 - (h) Permission of Village Panchayats and State Government for borrow earth; and
 - (i) Any other permits or clearances required under Applicable Laws.
- (ii) Applicable Permits, as required, relating to environmental protection and conservation shall have been procured by the Authority in accordance with the provisions of this Agreement.

SCHEDULE – G*(See Clauses 7.1, and 19.2)***FORM OF BANK GUARANTEE**

Annex-I

*(See Clause 7.1.)***Performance Security/Additional Performance Security**

The Chief General Manager,

Bihar State Road Development Corporation Ltd, Patna

WHEREAS:

- (A) _____ [name and address of contractor] (hereinafter called the “**Contractor**”) and Bihar State Road Development Corporation Ltd. (BSKDCL), RCD, Central Mechanical Workshop Campus, Near Airport, Sheikhpura, Patna, Bihar-800014, (hereinafter called the “**Authority**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the **Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt- Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi-Chaughara Road (SH-95) from KM 0+000 to KM 28+080 (Length -28.080 Km) in the State of Bihar on EPC Mode under Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95** subject to and in accordance with the provisions of the Agreement
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period / Defects Liability Period and Maintenance Period}(as defined in the Agreement) in a sum of Rs. cr. (Rupees crore) (the “**Guarantee Amount**”).
- (C) We,.....through our branch at.....(the “**Bank**”) have agreed to furnish this bank guarantee (*herein after called the* “**Guarantee**”) by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse contest or protest, and without any reference to the Contractor, such sum or sums upto an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/ or for the sum specified therein.
2. A letter from the Authority, under the hand of an officer not below the rank of General Manager in the Bihar State Road Development Corporation Ltd, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Authority shall be the sole

judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

3. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in anyway or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the agreement or to extend the time or period for the compliance with, fulfillment and / or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Agreement or for the fulfillment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained herein before, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on ****. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly Authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such

notice, when given by post, it shall be sufficient to prove that the envelope containing then notice was posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.
12. This guarantee shall also be operatable and payable at our Patna Branch at Patna, from whom, confirmation regarding the issue of this guarantee or extension / renewal / encashment thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment hereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. The guarantor / bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of BSRDCL, details of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	Bihar State Road Development Corporation Ltd
2.	Name of Bank	Canara Bank; Patliputra Colony, Patna
3.	Account No.	2518101005873
4.	IFSC Code	CNRB0002518

Notwithstanding anything contained herein

- i) Our liability under the bank Guarantee shall not exceed Rs.(RupeesOnly)
- ii) This Bank Guarantee shall be valid up toand
- iii) We are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand which is received by us on or before, after which date we shall stand discharged of all our liabilities arising hereunder.

Signed and sealed this day of, 20..... at

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.

- (ii) *The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch*

Not to be used as a Bid Document, Only for Reference

Annex – II
(Schedule - G)
(See Clause 19.2)

Form for Guarantee for Advance Payment

The Chief General Manager,

Bihar State Road Development Corporation Ltd., Patna

WHEREAS:

- (A) [name and address of contractor] (herein after called the “**Contractor**”) has executed an agreement (herein after called the “**Agreement**”) with the Bihar State Road Development Corporation Ltd. (BSRDCL), RCD, Central Mechanical Workshop Campus, Near Airport, Sheikhpura, Patna, Bihar-800014, (herein after called the “**Authority**”) for the **Improvement/Upgradation, Widening and Strengthening of Mansi-Fungo Halt- Simri Bakhtiyarpur Section of Mansi-Saharsa-Hardi-Chaughara Road (SH-95) from KM 0+000 to KM 28+080 (Length -28.080 Km) in the State of Bihar on EPC Mode under Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95**, subject to and in accordance with the provisions of the Agreement
- (B) In accordance with Clause 19.2 of the Agreement, the Authority shall make to the Contractor an interest bearing (@ Bank Rate+3% advance payment (herein after called “**Advance Payment**”) equal to 10% (ten percent) of the Contract Price; and that the Advance Payment shall be made in two installments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such installment to remain effective till the complete and full repayment of the installment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs.-----cr. (Rupees-----crore) and the amount of this Guarantee is Rs.-----cr. (Rupees-----crore), (the “**Guarantee Amount**”).
- (C) We, through our branch at..... (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

- The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid installment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the Authority, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Authority shall claim, without the Authority being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.

A letter from the Authority, under the hand of an officer not below the rank of General Manager in the Bihar State Road Development Corporation Ltd, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the installment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding

on the Bank. The Bank further agrees that the Authority shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Authority and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.

2. In order to give effect to this Guarantee, the Authority shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
3. It shall not be necessary, and the Bank hereby waives any necessity, for the Authority to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
4. The Authority shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for anytime, and from time to time, any of the rights and powers exercisable by the Authority against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Authority, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Authority or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
5. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Authority in respect of or relating to the Advance Payment.
6. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Authority on the Bank under this Guarantee all rights of the Authority under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
7. The Guarantee shall cease to be in force and effect on..... Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
8. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Authority in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorized to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was

posted and a certificate signed by an officer of the Authority that the envelope was so posted shall be conclusive.

10. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the Authority pursuant to the provisions of the Agreement.
11. This guarantee shall also be operatable and payable at our Branch at Patna, from whom, confirmation regarding the issue of this guarantee or extension/renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
12. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of BSRDCL, details of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	Bihar State Road Development Corporation Ltd
2.	Name of Bank	Canara Bank; Patliputra Colony, Patna
3.	Account No.	2518101005873
4.	IFSC Code	CNRB0002518

Notwithstanding anything contained herein

- i) Our liability under the bank Guarantee shall not exceed Rs. (RupeesOnly)
- ii) This Bank Guarantee shall be valid up toand
- iii) We are liable to pay the guaranteed amount or any part thereof under this guarantee, only and only if you serve upon us a written claim or demand which is received by us on or before, after which date we shall stand discharged of all our liabilities arising hereunder.

Signed and sealed this day of, 20..... at

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

SCHEDULE H

(See Clauses 10.1(iv) and 19.3)

Contract Price Weightages

- 1.1 The Contract Price for this Section-II (Fungo Halt-Simri Bakhtiyarpur Section) from KM 14+125 to KM 28+080 (Length -13.955 Km) is Rs..... Crores.
- 1.2 Proportions of the Contract Price for different stages of Construction of the Project Highway shall be as specified below:

Item	Weightage in % of CP	Stage for Payment	Percentage weightage
(1)	(2)	(3)	(4)
Road Works including Widening, strengthening/ Reconstruction / realignment, new Culverts, widening and repair of culverts, Reconstruction on existing road	64.89%	A- Widening and Strengthening /New /Reconstruction/ Realignment / overlay of existing road/ Missing Link/ Service Road/Junctions, etc.	
		(1) Earthwork up to top of the sub-grade (Without Shoulder), Scarifying and C&G for the project length	27.02%
		(2) Earthwork in Shoulders for the project length	0.37%
		(3) Sub-base Course (GSB) for the project length	22.49%
		(4) Non bituminous Base course (WMM) for the project length	17.92%
		(5) Bituminous Base course work including tack coat (Prime coat +Tack coat+ DBM) for the project length	17.18%
		(6) Wearing Coat (BC) +Tack coat for the project length	8.61%
		(7) Widening and repair of Slab culverts and Hume Pipe Culverts for the project length	0.00%
		B- Reconstruction/Realignment / Bypass/New service road (Rigid Pavement)	
		(1) Dry Lean Concrete (DLC) Course	0.43%
		(2) Pavement Quality Control (PQC) Course	1.39%

		C- Reconstruction & New Culverts on existing road, realignments, missing link/ bypasses Culverts (length <6m)	4.60%
Minor bridge/ Underpasses/ Overpasses	4.70%	A.1- Widening and repairs of Minor Bridges (length>6m &<60m)	
		Minor Bridges	0.00%
		A.2- New Minor bridges (length >6 m and < 60 m)	
		(1) Foundation:	33.80%
		(2) Sub-structure:	17.09%
		(3) Super-structure including bearings:	19.69%
		(4) Approaches (including weep hole, backfilling, filter media, Approach slab, Return/Retaining wall, protection works, etc.):	26.51%
		(5) Guide Bunds and River Training Works:	0.00%
		(6) Miscellaneous Works: (wearing coat, drainage spouts, expansion joints, painting, RCC Railing, hand rails, footpath/separators, crash barriers, road signs & markings, etc.)	2.92%
		E.1- Widening and repairs of underpasses/overpasses	
		Underpasses/ Overpasses	0.00%
		B.2- New Underpasses/Overpasses	
		(1) Foundation:	0.00%
		(2) Sub-structure:	0.00%
(3) Super-structure:	0.00%		
(4) Wing wall/return wall	0.00%		
(5) Approaches and Miscellaneous Works (wearing coat, expansion joints, hand rails, crash barriers, stone pitching, protection works, road signs & markings, etc.)	0.00%		

		Wearing Coat (a) in case of Overpass- wearing coat including expansion joints	0.00%
		(b) in case of underpass-rigid pavement including drainage facility	0.00%
Major bridge(length>60m) works and ROB/RUB/ Elevated/flyover including viaducts, if any	18.29%	A.1- Widening and repairs of Major Bridges	
		(1) Foundation:	0.00%
		(2) Sub-structure:	0.00%
		(3) Super-structure:	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings, RCC crash barrier Painting,	0.00%
		(6) Wing walls/return walls upto top	0.00%
		(7) Guide bunds, River Training works etc.	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		A.2- New Major Bridges	
		(1) Foundation:	0.00%
		(2) Sub-structure:	0.00%
		(3) Super-structure:	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
		(6) Wing walls/return walls upto top	0.00%
		(7) Guide bunds, River Training works etc.	0.00%
		(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%
		B.1- Widening and repairs of	
		(a) ROB	
(b) RUB			
(1) Foundations	0.00%		
(2) Sub-Structure	0.00%		

	(3) Super-Structure (Including bearings)	0.00%
	(4) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and	0.00%
	(b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%
	(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
	(6) Wing walls/Return walls	0.00%
	(7) Retaining / Reinforced earth walls	0.00%
	(8) Approaches (including RE, Wall and protection works, etc.)	0.00%
	B.2- New ROB/RUB	
	(1) Foundations	13.83%
	(2) Sub-Structure	3.75%
	(3) Super-Structure (Including bearings)	44.46%
	(4) Wearing Coat (a) in case of ROB-wearing coat including expansion joints complete in all respects as specified and	0.70%
	(b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%
	(5) Miscellaneous Items like RCC railing, drainage spout, hand rails, crash barrier, footpath/separators, painting, road markings etc.	8.66%
	(6) Wing walls/Return walls	0.00%
	(7) Approaches (including Retaining / Reinforced earth walls, fascia panel, weep holes, fixing of pipes, protection works, filter media, backfilling, approach slab, toe wall/curtain wall, etc.)	28.60%

		C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	0.00%
		(2) Sub-Structure	0.00%
		(3) Super-Structure (Including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
		(6) Wing walls/Return walls	0.00%
		(7) Retaining / Reinforced earth walls	0.00%
		(8) Approaches (including RE Wall and protection works, etc.)	0.00%
		C.2- New Elevated Section/Flyovers/Grade Separators	
		(1) Foundations	0.00%
		(2) Sub-Structure	0.00%
		(3) Super-Structure (Including bearings)	0.00%
		(4) Wearing Coat including expansion joints	0.00%
		(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%
		(6) Wing walls/Return walls	0.00%
		(7) Retaining / Reinforced earth walls	0.00%
		(8) Approaches (including RE Wall and protection works, etc.)	0.00%
Other Works	12.11%	(i) Toll Plaza	0.00%
		(ii) Drain cum Footpath	12.18%
		(iii) Road Safety	
		a) Road signs Boards	5.20%
		b) Road markings	2.42%
		c) Kerb and KM Stones (Hectometer, Kilometer stone, boundary stone etc.)	0.57%

	d)retro-reflectorized road indicators & Delineators	1.17%
	e) safety Devices Movable crash barrier	0.00%
	f) " W " metal beam crash barrier	7.78%
	(iv) Project facilities	
	a) Bus Lay Bay including passenger shelter, marking, etc.	14.38%
	b) Truck lay Bye	0.00%
	c)Road Side Rest Area	0.00%
	d) others	0.00%
	(v) Road side plantation	
	a) Planting tree sapling by roadside including tree guard	12.95%
	b) Rain water harvesting arrangement	0.78%
	(vi) protection works including RE wall other than approaches to the bridges, elevated section /flyover/grade separators and ROBs/ RUBs & Toe wal to the slope of embankmen.	14.05%
	(vii) Safety and traffic management during construction	0.00%
	(viii) Miscellaneous including Intersection and junctions Works, Utility Duct, installation of hand pump, relocation of temples/religious structures, CPR, EMP Parameter testing (air, noise, water, soil), etc.	23.01%
	(ix) Highway Lighting (6 nos. High Mast & 65 nos. Street lights)	5.49%

1.3. Procedure of estimating the value of work done.		
1.3.1 Road Works including Widening, strengthening/ Reconstruction / realignment, new Culverts, widening and repair of culverts, Reconstruction on existing road		
Procedure for estimating the value of road work done shall be as follows:		
Table 1.3.1		
Stage of Payment	Percentage weightage	Payment Procedure
A- Widening and Strengthening /New /Reconstruction/ Realignment / overlay of existing road/ Missing Link/ Service Road/Junctions, etc.		
(1) Earthwork up to top of the sub-grade (Without Shoulder), Scarifying and C&G for the project length	17.54%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or cumulative 500 meter length (both sides in full width) or cumulative 1000 meter length (one side in full width)
(2) Earthwork in Shoulders for the project length	0.24%	
(3) Sub-base Course (GSB) for the project length	14.59%	
(4) Non bituminous Base course (WMM) for the project length	11.63%	
(5) Bituminous Base course work including tack coat (Prime coat +Tack coat+ DBM) for the project length	11.15%	
(6) Wearing Coat (BC) +Tack coat for the project length	5.58%	
(7) Widening and repair of Slab culverts and Hume Pipe Culverts for the project length	0.00%	
B- Reconstruction/Realignment / Eypass/New service road (Rigid Pavement)		
(1) Dry Lean Concrete (DLC) Course	0.28%	Unit of measurement is linear length. Payment of each stage shall be made on pro rata basis on completion of a stage in full length or cumulative 500 meter length (both sides in full width) or cumulative 1000 meter length (one side in full width)
(2) Pavement Quality Control (PQC) Course	0.90%	
D- Reconstruction & New Culverts on existing road, realignments, bypasses		

Culverts (length <6m)	2.98%	Cost of each culverts shall be determined on pro rata basis with respect to the total number of culverts. Payment shall be made on the completion of at least five culverts
For example, if the total length of bituminous work to be done is 100 km, the cost per km of bituminous work shall be determined as follows:		
Cost per km = P x weightage for road work x weightage for bituminous work x (1/L)		
Where		
P = Contract Price		
L = Total length in km		

1.3.2 Minor Bridges and Underpasses/Overpasses

Procedure for estimating the value of Minor bridge and Underpasses/Overpasses shall be as stated in table 1.3.2:

Table 1.3.2		
Stage of Payment (1)	Weightage (2)	Payment Procedure (3)
A.1- Widening and repairs of Minor Bridges (length>6m &<60m)		
Minor Bridges	0%	
A.2- New Minor bridges (length >6 m and < 60 m)		
(1) Foundation:	1.59%	Foundation: Cost of each structure shall be determined on pro- rata basis with respect to the total linear length (m) of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of at least one foundations (including its cap in case of pile foundation). In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.

(2) Sub-structure:	0.80%	Sub-structure: Cost of each structure shall be determined on pro- rata basis with respect to the total linear length (m) of the structure. Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the structure subject to completion of at least one sub-structures of abutments/piers upto top of the abutment/pier cap level of the structure.
(3) Super-structure including bearings:	0.93%	Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super structure of at least one span in all respects as specified in the column of "Stage of Payment" in this sub- clause. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above
(4) Approaches (including weep hole, backfilling, filter media, Approach slab, Return/Retaining wall, protection works, etc.):	1.25%	Approaches: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of approaches in all respect as specified in the column of "Stage of Payment" in this sub-clause.
(5) Guide Bunds and River Training Works:	0.00%	N/A
(6) Miscellaneous Works: (wearing coat, drainage spouts, expansion joints, painting, RCC Railing, hand rails, footpath/separators, crash barriers, road signs & markings, etc.)	0.14%	Miscellaneous work: Payments shall be made on completion of all miscellaneous works like wearing coat, drainage spouts, expansion joints, painting, RCC Railing, hand rails, footpath/separators, crash barriers, road signs & markings, etc. complete in all respect.
B.1- Widening and repairs of Underpasses/overpasses		N/A
Underpasses/ Overpasses	0.00%	
B.2- New Underpasses/Overpasses		
(1) Foundation:	0.00%	
(2) Sub-structure	0.00%	

(3) Super-structure	0.00%	
(4) Wing wall/return wall	0.00%	
(5) Approaches and Miscellaneous Works (wearing coat, expansion joints, hand rails, crash barriers, stone pitching, protection works, road signs & markings, etc.)	0.00%	
Wearing Coat (a) in case of Overpass- wearing coat including expansion joints	0.00%	
(b) in case of underpass-rigid pavement including drainage facility	0.00%	

1.3.3 Major Bridge (length>60 m), ROB/RUB and viaduct, if any

Procedure for estimating the value of Major Bridge works, ROB/RUB and Structures Work shall be as stated in table 1.3.3:

Table 1.3.3

Stage of Payment	Percentage Weightage	Payment Procedure
A.1- Widening and repairs of Major Bridges		
(1) Foundation:	0.00%	N/A
(2) Sub-structure:	0.00%	
(3) Super-structure:	0.00%	
(4) Wearing Coat including expansion joints	0.00%	
(5) Miscellaneous Items like hand rails, crash barrier, road markings, RCC crash barrier Painting,	0.00%	
(6) Wing walls/return walls upto top	0.00%	
(7) Guide bunds, River Training works etc.	0.00%	
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	
A.2- New Major Bridges		

(1) Foundation:	0.00%	N/A
(2) Sub-structure:	0.00%	
(3) Super-structure (including bearings)	0.00%	
(4) Wearing Coat including expansion joints	0.00%	
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	
(6) Wing walls/return walls upto top	0.00%	
(7) Guide bunds, River Training works etc.	0.00%	
(8) Approaches (including Retaining walls, stone pitching and protection works)	0.00%	
B.1- Widening and repairs of		N/A
(a) ROB	0.00%	
(b) RUB		
(1) Foundations	0.00%	
(2) Sub-Structure	0.00%	
(3) Super-Structure (Including bearings)	0.00%	
(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and	0.00%	
(b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%	
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	
(6) Wing walls/Return walls	0.00%	
(7) Retaining / Reinforced earth walls		
(8) Approaches (including RE Wall and protection work, etc.)	0.00%	
B.2- New ROB/RUB		

(1) Foundations	2.53%	<p>Foundation: Cost of each structure shall be determined on pro- rata basis with respect to the total linear length (m) of the structure. Payment against foundation shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of foundation of the structure subject to completion of at least one foundations (including its cap in case of pile foundation).</p> <p>In case where load testing is required for foundation, the trigger of first payment shall include load testing also where specified.</p>
(2) Sub-Structure	0.69%	<p>Sub-structure: Cost of each structure shall be determined on pro- rata basis with respect to the total linear length (m) of the structure. Payment against sub- structure shall be made on pro-rata basis on completion of a stage i.e. not less than 25% of the scope of sub-structure of the structure subject to completion of at least one sub-structures of abutments/piers upto top of the abutment/pier cap level of the structure.</p>
(3) Super-Structure (Including bearings)	8.13%	<p>Super-structure: Payment shall be made on pro-rata basis on completion of a stage i.e. completion of super-structure including bearings of at least one span in all respects as specified. In case of structures where pre-cast girders have been proposed by the Contractor, 50% of the stage payment shall be due and payable on casting of girders for each span and balance 50% of the stage payment shall be made on completion of stage specified as above</p>
(4) Wearing Coat (a) in case of ROB- wearing coat including expansion joints complete in all respects as specified and	0.13%	<p>Wearing Coat: Payment shall be made on completion of wearing coat including expansion joints complete in all respects as specified.</p>
(b) in case of RUB-rigid pavement under RUB including drainage facility complete in all respects as specified	0.00%	N/A

(5) Miscellaneous Items like RCC railing, drainage spout, hand rails, crash barrier, footpath/ separators, painting, road markings etc.	1.58%	Miscellaneous work: Payments shall be made on completion of all miscellaneous works like RCC railing, drainage spout, hand rails, crash barrier, footpath/ separators, painting, road markings etc. complete in all respect.
(6) Wing walls/Return walls	0.00%	N/A
(7) Approaches (including Retaining / Reinforced earth walls, fascia panel, weep holes, fixing of pipes, protection works, filter media, backfilling, approach slab, toe wall/curtain wall, etc.)	5.23%	Approaches: Payment shall be made on completion of 25% of total RE wall area of each structure
C.1- Widening and repair of Elevated Section/Flyovers/Grade Separators		N/A
(1) Foundations	0.00%	
(2) Sub-Structure	0.00%	
(3) Super-Structure (Including bearings)	0.00%	
(4) Wearing Coat including expansion joints	0.00%	
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	
(6) Wing walls/Return walls	0.00%	
(7) Retaining / Reinforced earth walls	0.00%	
(8) Approaches (including RE Wall and protection works, etc.)	0.00%	
C.2- New Elevated Section/Flyovers/Grade Separators		N/A
(1) Foundation	0.00%	
(2) Sub-structure	0.00%	
(3) Super-structure		
(4) Wearing Coat including expansion joints	0.00%	
(5) Miscellaneous Items like hand rails, crash barrier, road markings etc.	0.00%	
(6) Wing walls/Return walls	0.00%	

(7) Retaining / Reinforced earth walls	0.00%	
(8) Approaches and Other Miscellaneous Works (wearing coat, expansion joints, hand rails, crash barriers, road signs & markings, stone pitching, protection works etc.)	0.00%	

1.3.4 Other Works.

Procedure for estimating the value of other works done shall be as stated in table 1.3.4:

Table 1.3.4		
Stage of Payment	Percentage Weightage	Payment Procedure
(i) Toll Plaza	0.00%	N/A
(ii) Drain cum Footpath	1.47%	Payment shall be made on pro rata basis on completion of cumulative length of 1 km.
(iii) Road Safety		
a) Road signs Boards	0.63%	
b) Road markings	0.29%	
c) Kerb and KM Stones (Hectometer, Kilometer stone, boundary stones etc.)	0.07%	
d) retro-reflectorized road indicators & Delineators	0.14%	
e) safety Devices Movable crash barrier	0.00%	
f) " W " metal beam crash barrier	0.94%	
(iv) Project facilities	0.00%	Unit of measurement is each completed facility. Payment shall be made on completion of each bus bay in all respect
a) Bus Lay Bay including passenger shelter, marking, etc.	1.74%	
b) Truck lay Bye	0.00%	
c) Road Side Rest Area	0.00%	
d) others	0.00%	
(v) Road side plantation	0.00%	N/A
a) Planting tree sapling by roadside including tree guard	1.57%	
b) Rain water harvesting arrangement	0.09%	
		Unit of measurement is each completed facility in all respect.
		Unit of measurement is each completed facility in all respect.

(vi) protection works including RE wall other than approaches to the bridges, elevated section /flyover/grade separators and ROBs/ RUBs & Toe wall to the slope of embankment	1.70%	Payment shall be made on pro rata basis on completion of cumulative length of 1 km.
(vii) Safety and traffic management during construction	0.00%	No payment, however included in other items under ACP
(viii) Miscellaneous including Intersection and junctions Works, Utility Duct, installation of hand pump, relocation of temples/religious structures, CPR, EMP Parameter testing (air, noise, water, soil), etc.	2.79%	Unit of measurement is each completed facility. Payment shall be made on completion of each Intersection and junctions Works, Utility Duct, installation of hand pump, relocation of temples/religious structures, CPR, EMP Parameter testing (air, noise, water, soil), etc.
(ix) Highway Lighting (6 nos. High Mast & 65 nos. Street lights)	0.67%	Payment shall be made on pro rata basis on completion of cumulative length of 1 km.

Note: Any/all rounding mismatch for any/all item/sub-item shall be adjusted in the last payment of that item/sub-item.

2	Procedure for payment for maintenances
2.1	The cost for maintenance shall be stated in Clause 14.1
2.2	Payment for maintenance shall be made in quarterly installments in accordance with provisions of Clause 19.7

SCHEDULE – I

(See Clause 10.2(iv))

DRAWINGS

1. Drawings

In compliance of the obligations set forth in Clause 10.2 of this Agreement, the Contractor shall furnish to the Authority's Engineer, free of cost, all Drawings listed in Annex-I of this Schedule-I.

2. Additional Drawings

If the Authority's Engineer determines that for discharging its duties and functions under this Agreement, it requires any drawings other than those listed in Annex-I, it may by notice require the Contractor to prepare and furnish such drawings forthwith. Upon receiving a requisition to this effect, the Contractor shall promptly prepare and furnish such drawings to the Authority's Engineer, as if such drawings formed part of Annex-I of this **Schedule-I**.

Annex-I

(Schedule- I)

List of Drawings

Following drawing is required to be furnished by contractor: -

Drawings of horizontal alignment, vertical profile and cross sections.

- (i) Drawings of cross drainage works.
- (ii) Drawings of interchanges, minor intersections, major intersections, grade separators, underpasses.
- (iii) Drawings of road furnitures items including traffic signage, markings, safety barriers, etc.
- (iv) Drawings of traffic diversion plans and traffic control measures.
- (v) Drawings of bridges and culverts.
- (vi) Drawing for ROB with approaches.
- (vii) Drawings of typical details slope protection measures.
- (viii) Drawings of pedestrian crossings.
- (ix) Drawings of project facilities provided.
- (x) Drawings of street lighting & High Mast Pole.
- (xi) Any other drawings related to project as required by Authority Engineer.

SCHEDULE – J

(See Clause 10.3(ii))

PROJECT COMPLETION SCHEDULE**1 Project Completion Schedule**

During Construction period, the Contractor shall comply with the requirements set forth in this Schedule-J for each of the Project Milestones and the **Scheduled Completion Date**. Within 15 (fifteen) days of the date of each Project Milestone, the Contractor shall notify the Authority of such compliance along with necessary particulars thereof.

2 Project Milestone-I

- (i) Project Milestone-I shall occur on the date falling on the **256th (Two Hundred and Fifty Sixth)** day from the Appointed Date (the “**Project Milestone-I**”).
- (ii) Prior to the occurrence of Project Milestone-I, the Contractor shall have commenced construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 10% (Ten per cent) of the Contract Price.

3 Project Milestone-II

- (i) Project Milestone-II shall occur on the date falling on the **433th (Four Hundred and Thirty Eighth)** day from the Appointed Date (the “**Project Milestone-II**”).
- (ii) Prior to the occurrence of Project Milestone-II, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 35% (thirty five per cent) of the Contract Price and should have started construction of all bridges.

4 Project Milestone-III

- (i) Project Milestone-III shall occur on the date falling on the **621st (Six Hundred and Twenty First)** day from the Appointed Date (the “**Project Milestone-III**”).
- (ii) Prior to the occurrence of Project Milestone-III, the Contractor shall have continued with construction of the Project Highway and submitted to the Authority duly and validly prepared Stage Payment Statements for an amount not less than 70% (seventy per cent) of the Contract Price and **should have started construction of all project facilities**.

5 Scheduled Completion Date

- (i) The Scheduled Completion Date shall occur on the **730th (Seven Hundred and Thirtieth)** day from the Appointed Date.
- (ii) On or before the Scheduled Completion Date, the Contractor shall have completed construction in accordance with this Agreement.

6 Extension of time

Upon extension of any or all of the aforesaid Project Milestones or the Scheduled Completion Date, as the case maybe, under and in accordance with the provisions of this Agreement, the Project Completion Schedule shall be deemed to have been amended accordingly.

SCHEDULE - K

*(See Clause 12.1(ii))***Tests on Completion****1. Schedule for Tests**

- (i) The Contractor shall, no later than 30 (thirty) days prior to the likely completion of construction, notify the Authority's Engineer and the Authority of its intent to subject the Project Highway to Tests, and no later than 10 (ten) days prior to the actual date of Tests, furnish to the Authority's Engineer and the Authority detailed inventory and particulars of all works and equipment forming part of Works.
- (ii) The Contractor shall notify the Authority's Engineer of its readiness to subject the Project Highway to Tests at any time after 10 (ten) days from the date of such notice, and upon receipt of such notice, the Authority's Engineer shall, in consultation with the Contractor, determine the date and time for each Test and notify the same to the Authority who may designate its representative to witness the Tests. The Authority's Engineer shall thereupon conduct the Tests itself or cause any of the Tests to be conducted in accordance with Article 12 and this Schedule-K.

2. Tests

- (i) Visual and physical test: The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provisions of this Agreement. The physical tests shall include (to be decided in consultation with Authority's Engineer at the time of physical tests as per relevant IRC code Manual).
- (ii) Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a Network Survey Vehicle (NSV) fitted with latest equipment and the maximum permissible roughness for purposes of this Test shall be 1,800 (Eighteen hundred) mm for each kilometre.
- (iii) Tests for bridges/Elevated Structure: All major, minor bridges and Elevated Structure shall be subjected to the rebound hammer and ultrasonic pulse velocity tests, to be conducted in accordance with the procedure described in Special Report No. 17: 1996 of the IRC Highway Research Board on Non-destructive Testing Techniques, at two spots in every span, to be chosen at random by the Authority's Engineer. Bridges/ Structures with a span of 15 (fifteen) metres or more shall also be subjected to load testing.
- (iv) Other tests: The Authority's Engineer may require the Contractor to carry out or cause to be carried additional tests, in accordance with Good Industry Practice, for determining the compliance of the Project Highway with Specifications and Standards, excepts tests specified in clause 5, but shall include measuring the reflectivity of road markings and road sign; and measuring the illumination level (lux) of lighting equipment using requisite testing equipment.
- (v) Environmental audit: The Authority's Engineer shall carry out a check to determine conformity of the Project Highway with the environmental requirements set forth in Applicable Laws and Applicable

Permits.

- (vi) Safety Audit: The Authority's Engineer shall carry out, or cause to be carried out, a safety audit to determine conformity of the Project Highway with the safety requirements and Good Industry Practice.

3 Agency for conducting Tests

All Tests set forth in this Schedule-K shall be conducted by the Authority's Engineer or such other agency or person as it may specify in consultation with the Authority.

4 Completion Certificate

Upon successful completion of Tests, the Authority's Engineer with prior approval of the Authority shall issue the Completion Certificate in accordance with the provisions of Article 12. The Authority or Authority Representative shall ensure that the completion certificate is approved after verifying/confirming that all works/items including ancillary items forming part of the project Highway are completed in all respects conforming to the Standard and Specifications of the Ministry. A video of completed work on the date of completion shall invariably be prepared and furnished as an authentic documentary evidence of completion of works within 15 days of completion without which completion certificate shall not be issued. Authority Engineer, apart from furnishing a certificate of completion and all tests as per specifications in accordance with contract, will also certify that all NCRs issued during the contract have been closed after successful rectification of defects within the completion date.

5. The Authority Engineer will carry out tests with following equipment at Contractor's cost in the presence of Contractor's representative.

Sr. No.	Key Metric of Asset	Equipment to be used	Frequency of condition Survey
1	Surface defects of Pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the State basis rainy season.)
2.	Roughness of Pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the State basis rainy season.)
3.	Strength of Pavement	Falling weight Deflectometer (FWD)	At least once a year
4.	Bridges/ Elevated Road/ Structures	By any suitable standard methods	At least twice a year (As per survey months defined for the State basis rainy season.)
5.	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the State basis rainy season.)

The first testing with the help of NSV shall be conducted at the time of issue of completion certificate.

SCHEDULE – L

(See Clause 12.2)

COMPLETION CERTIFICATE

- 1 I,.....(Name of the Authority’s Engineer), acting as the Authority’s Engineer, under and in accordance with the Agreement dated(the “Agreement”),for **Improvement/Upgradation, Widening and Strengthening of Fungo Halt –Simri Bakhtiyarpur Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95), Section-II (KM 14+125 to KM 28+080) in the State of Bihar on EPC Mode under Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95** through (Name of Contractor), hereby certify that the Tests in accordance with Article 12 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 service of the Users thereof.
- 2 It is certified that, in terms of the aforesaid Agreement, all works forming part of Project Highway have been completed, and the Project Highway is hereby declared fit for entry into operation on this the day of 20..... , Scheduled Completion Date for which was the day of20.....

SIGNED, SEALED AND DELIVERED
For and on behalf of

the Authority’s Engineer by:

(Signature)

(Name)

(Designation)

(Address)

SCHEDULE - M

(See Clauses 14.6, 15.2 and 19.7)

PAYMENT REDUCTION FOR NON-COMPLIANCE**1. Payment reduction for non-compliance with the Maintenance Requirements**

- (i) Monthly lump sum payments for maintenance shall be reduced in the case of non-compliance with the Maintenance Requirements set forth in Schedule-E.
- (ii) Any deduction made on account of non-compliance with the Maintenance Requirements shall not be paid even after compliance subsequently. The deductions shall continue to be made every month until compliance is done.
- (iii) The Authority's Engineer shall calculate the amount of payment reduction on the basis of weightage in percentage assigned to non-conforming items as given in Paragraph 2.

2. Percentage reductions in lump sum payments

- (i) The following percentages shall govern the payment reduction:

S. No.	Item/Defect/Deficiency	Percentage
(a)	Carriageway/Pavement	
(i)	Potholes, cracks, other surface defects	15%
(ii)	Repairs of Edges, Rutting	5%
(b)	Road, Embankment, Cuttings, Shoulders	
(i)	Edge drop, inadequate cross fall, undulations, settlement, potholes, ponding, obstructions	10%
(ii)	Deficient slopes, raincuts, disturbed pitching, vegetation growth, pruning of trees	5%
(c)	Bridges and Culverts	
(i)	Desilting, cleaning, vegetation growth, damaged pitching, flooring, parapets, wearing course, footpaths, any damage to foundations	20%
(ii)	Any Defects in superstructures, bearings and sub-structures	10%

(iii)	Painting, repairs/replacement kerbs, railings, parapets, guideposts/crash barriers	5%
(d)	Roadside Drains	
(i)	Cleaning and repair of drains	5%
S. No.	Item/Defect/Deficiency	Percentage
(e)	Road Furniture	
(i)	Cleaning, painting, replacement of road signs, delineators, road markings, 200 m/km/5 th km stones	5%
(f)	Miscellaneous Items	
(i)	Removal of dead animals, broken down/accidental vehicles, fallen trees, road blockades or malfunctioning of mobile crane	10%
(ii)	Any other Defects in accordance with paragraph 1.	5%
(g)	Defects in Other Project Facilities	5%

- (ii) The amount to be deducted from monthly lump-sum payment for noncompliance of particular item shall be calculated as under:

$$R = (P/100) \times (M1 \text{ or } M2) \times (L1/L)$$

Where P = Percentage of particular item/Defect/deficiency for deduction

M1 = Monthly lump-sum payment in accordance with para 1.2 above of this schedule

M2 = Monthly lump-sum payment in accordance with para 1.2 above of this schedule

L1 = Non-complying length

L = Total length of the road,

R = Reduction (the amount to be deducted for noncompliance for a particular item/Defect/deficiency)

The total amount of reduction shall be arrived at by summation of reductions for each items/Defects/deficiency or noncompliance.

For any Defect in a part of one kilometer, the non-conforming length shall be taken as one kilometer.

SCHEDULE – N

(See Clause 18.1(i))

SELECTION OF AUTHORITY’S ENGINEER

1 Selection of Authority’s Engineer

The Authority shall appoint a firm of Consulting Engineers or a Project Management Authority Engineer (PMAE) substantially in accordance with the selection criteria set forth in Schedule-N, to be the engineer under this Agreement (the “**Authority’s Engineer**”). In unavoidable circumstances, Authority may appoint an officer to act as Authority’s Engineer until appointment of a Consulting Engineering firm/ Supervision Consultant/ PMAE.

(i) In the event of termination of the Technical Consultants appointed in accordance with the provisions of Paragraph 1(i), the Authority shall appoint another firm of Technical Consultants forthwith and may engage a government-owned entity in accordance with the provisions of Paragraph 3 of this Schedule-N.

2 Terms of Reference

The Terms of Reference for the Authority’s Engineer (the “**TOR**”) shall substantially conform with Annex 1 to this Schedule N.

3 Appointment of Government entity as Authority’s Engineer

Notwithstanding anything to the contrary contained in this Schedule, the Authority may in its discretion appoint a government owned entity as the Authority’s Engineer; provided that such entity shall be a body corporate having as one of its primary functions the provision of consulting, advisory and supervisory services for engineering projects; provided further that a government-owned entity which is owned or controlled by the Authority shall not be eligible for appointment as Authority’s Engineer.

Note: Project Management Authority Engineer is Authority Engineer. Wherever it is written PMAE or AE, both shall have the same meaning and same definition under the TOR, Article and contract.

Annex – I

(Schedule - N)

TERMS OF REFERENCE FOR AUTHORITY'S ENGINEER**TERMS OF REFERENCE (TOR) FOR PROJECT MANAGEMENT AND AUTHORITY ENGINEER****(PACKAGE NO. BSHP-III, Phase-2/PM AE/SH-95/, PACKAGE-2)****1. Introduction and Background**

- 1.1** Bihar State Road Development Corporation has been entrusted by the Government of Bihar with the responsibility of Rehabilitations, Upgrading & Strengthening of State Highways including construction of Major Bridges under Bihar State Highways III Project (BSHP-III,Phase-2). These Terms of Reference (TOR) define the services required of a firm of international consultants (the consultant) to carry out implementation support and authority engineering services consultant who is to be engaged to assist the Bihar State Road Development Corporation in the implementation of the aforementioned Project. The Project is being considered for financing by the Asian Development Bank (the Bank). The selected Project Roads under this package are proposed to be constructed on EPC Mode as described below:-

	Civil Package works	SH No.	Road Name	Length (Km)	Time for Completion (Month)	Team Leader Office
CSC Package No - BSHP-III, Phase-2/PM AE/ SH-95 PACKAGE-2	BSHP-III, Phase-2/3/SH-95	SH-95	Mansi To Fungo halt Section of Mansi-Saharsa-Hardi Chaughara Road	14.125	42	Mansi, Khagaria
	BSHP-III, Phase-2/4/SH-95	SH-95	Fungo Halt to Simri Bakhtiarpur Section of Mansi-Saharsa-Hardi Chaughara Road	13.955	24	
TOTAL				28.08		

* Project Location Index Maps is attached herewith as Annexure-5

The project is to construct a Road Project of SH-95 in 2 Sections (i) Mansi To Fungo halt Section of Mansi-Saharsa-Hardi Chaughara Road (14.125 KM) with 2 lane of paved shoulder with 04 Nos. Major Bridges (7x48.9m, 6x48.9m, 7x32.6m, 8x64m) including Minor Bridges, Box Culverts and one RoB etc. (ii) Fungo Halt to Simri Bakhtiarpur Section of Mansi-Saharsa-Hardi Chaughara Road (13.955 KM) with 2 lane of paved shoulder including Minor Bridges, Box Culvert one RoB etc. The main civil works contract will be structured in engineering, procurement, and construction (EPC), largely based on the model EPC agreement, and duly

amended for use by ADB.³⁰ BSRDCL will be designated as the “Authority” (or “Employer” as the case may be).

- 1.2** The project scope is to widen the existing carriageway and missing link to two lane carriageway width with earthen/paved shoulders on either side, upgrading and strengthening/reconstruction of existing pavement, rehabilitation and widening of the existing bridges, construction of new bridges and ROB, rehabilitation of existing culverts and construction of new culverts, construction of bus stops, truck parking areas, improvement of road junctions etc. The Contracts for the construction work will be procured under Open Competitive Bidding Procedures (OCB) and will be executed on Engineering Procurement and Construction (EPC) mode and the documents approved by ADB. The construction period would be as shown above against the respective civil works packages and the construction is expected to commence in **May, 2023**. BSRDC will administer the Project as the Employer through Project Implementation Unit (PIU).
- 1.3** One Project Management Authority Engineer (PMAE) is to be engaged for the assignment from the Short-Listed Consultants. The PMAE services will broadly include project management as ‘Engineer’ in terms of civil works contract, supervision and monitoring, quality assurance, environmental management, social safeguards, contract management and making engineering decisions, approval of decision, verification of quantity, recording of measurements and certification of measurement and bills of the Contractor administering for ensuring successful and timely implementation of these construction packages.
- 1.4** The Authority Engineer shall incorporate latest techniques and technological developments, and if required, offer advisory services on specific terms for satisfactory project implementation. It is anticipated that services of Authority Engineer would be required from May, 2023 for the duration of construction and Maintenance Period including defect notification period.
- 1.5** **Project Preparation**
- 1.5.1** The project preparation works have been carried out by the consulting firm engaged by the client i.e. Bihar State Road Development Corporation (BSRDC). The Authority Engineer will be required to review the entire data and modify the arrangements, if necessary, in consultation with the client (BSRDC).
- 1.5.2** The project reports/feasibility report for the road have been prepared for the proposed Asian Development Bank Project. The same needs to be reviewed with a view to include bridges, check the provisions for the roads and carry out designs etc.

2. Objectives and Scope

2.1 Objectives

The objective of the Project Management Authority Engineer services is to assist the Bihar State Road Development Corporation to implement the Project as follows:

- (i) To ensure high standards of quality assurance in the execution of work and consultant shall be made accountable for Project completion in scheduled time;

³⁰ The Agreement (including references to Clauses and Articles) substantially conforms with the “EPC Agreement” at https://morth.nic.in/sites/default/files/Revised_standard_EPC_Agreement_for_NH_and_Centrally_sponsored_road_works_proposed_to_be_implemented_on_EPC.pdf

- (ii) Comprehensive Supervision of project implementation activities carried out by the Contractor to ensure complete compliance with the drawings, technical specifications and various stipulations contained in the Contract Documents, with high standards of quality assurance in supervision and in the execution of work;
- (iii) Efficient construction supervision and monitoring by personnel who are experienced in modern methods of construction supervision and contract management.
- (iv) Proper management of civil works contracts as "the Authority Engineer" in terms of civil works contract; and
- (v) The main objective of the consulting services is to support BSRDCL to implement the project, as required under the ADB loan, and encompass (i) providing overall project management support which include developing and monitoring project implementation schedule with milestones and critical path analysis, and preparing progress reports as required for management of the project and reporting to ADB, (ii) monitoring the implementation of safeguards in accordance with ADB's Safeguard Policy Statement, (iii) ensuring implementation of the Environmental Management Plan (EMP) and other measures related to environmental protection in accordance with ADB's Safeguard Policy Statement, (iv) enhancing road safety measures, and (v) discharging the functions and duties of an Authority's Engineer.

2.2 Scope of Services

The scope of services is described below.

Component 1: Overall Project Management

- Task (01) Provide project management services throughout design, procurement, construction, and commissioning stages. The consultant is to maintain and update the project schedule throughout the project, and undertake project performance management system in the format acceptable by the Employer and ADB, which consists of (1) preparing in the initial stage a project performance management system, in accordance with the ADB's project design and monitoring framework, to monitor (i) the progress of the overall project implementation, and (ii) the development impact of the project; and (2) collecting/updating the project performance indicator benchmarks.

Component 2: Social Safeguard Implementation and Monitoring

- Task (02) Ensure implementation of Resettlement Plans (RPs) in accordance with ADB's Safeguard Policy Statement (2009) and other related policies such as the Public Communications Policy (2012) and the right to fair Compensation and Transparency in land acquisition, Rehabilitation and Resettlement Act, 2013 of the Government of India. The consultant will ensure payment of compensation to people affected by the project prior to hand-over of the site to the contractor. Prepare the due-diligence reports on resettlement implementation as needed for processing of subsequent tranches under the MFF. Provide monthly and quarterly reports on resettlement implementation, including close monitoring of resettlement implementation of Indigenous Peoples, and provide updates on the schedule and financial aspects of resettlement to the team. Monitor and provide guidance to the work of the NGOs for resettlement

implementation engaged by BSRDCL and monitor the resettlement implementation at the project sites and provide training, if required, to the BSRDCL staff.

- Task (03) Act as the external monitor for the project, tasks include: (i) develop specific monitoring indicators for undertaking monitoring of RP; (ii) review results of internal monitoring and verify claims through random checking by adopting suitable sampling method at the field level to assess whether land acquisition/resettlement objectives have been generally met; (iii) Involve the affected people and community groups in assessing the impact of land acquisition for monitoring and evaluation purposes; (iv) Evaluate and assess the adequacy of compensation given to the DPs and the livelihood opportunities and incomes as well as the quality of life of DPs of project-induced changes; and (v) evaluate and assess the adequacy and effectiveness of the consultative process with DPs, particularly those vulnerable, including the adequacy and effectiveness of grievance procedures and legal redress available to the displaced persons, and dissemination of information about these. Lastly ensuring the implementation of the social and gender relevant features included in the design of the project, including monitoring of HIV and human trafficking community awareness activities, as well as compliance of core labor standards by civil works contractors. External monitoring report is to be submitted to ADB on a semi-annual basis.

Component 3: Environmental Monitoring

- Task (04) Ensure implementation of the Environmental Management Plan (EMP) and other measures related to environmental protection as given in the EIA report and in accordance with ADB's Safeguard Policy Statement (2009). Update the EMP and EIA report as necessary and advise BSRDCL and the contractor in the event of un-anticipated impacts. Prepare due-diligence reports on EMP implementation as needed for processing of subsequent loans under the MFF. Provide monthly and quarterly reports on EMP implementation and provide updates on the schedule and financial aspects to the team. Provide necessary support, on coordination and monitoring of environment safeguards to BSRDCL staff.
- Task (05) Monitor implementation of the EMP by the contractor and ensure compliance with the environmental safeguard requirements of civil works contracts. Provide training and technical advices including on-site advice to the contractors as found necessary. Review and confirm that the EMP implementation records are maintained by the contractor. Prepare semi-annual environmental monitoring reports based on these records and on-site spot checks carried out and submit to BSRDCL.

Component 4: Road Safety

- Task (06) Conduct road safety audits with use of ADB's Road Safety Audit for Road Project; An Operational Tool Kit or similar procedures acceptable to ADB. The following will be carried out:
- a) conduct pre-audit meetings with BSRDCL and the contractor's design team to review project information and drawings;
 - b) conduct office safety review of detailed designs combined with mandatory field visits to the project roads conducted both during daytime and nighttime, together with

representatives of local field offices of BSRDCL, and other representatives (e.g., police) as appropriate;

- c) conduct office road safety audit analysis and preparing concise Road Safety Audit Reports for the project with the list of road safety issues identified, highway risk for each issue assessed, and specific countermeasures proposed to be incorporated into detailed designs;
- d) present findings and recommendations to BSRDCL and detailed design team; and
- e) checking the revised detailed designs to ensure that measures to address road safety issues, as endorsed by BSRDCL, are incorporated in detailed designs; and preparation of provisions for managing road safety aspects appropriately during construction to be included in all bidding documents

Task (07) Conduct awareness programs to concerned MORTH officers, supervision consultants, and contract staff. Involve local community, including women, in safety awareness activities.

Component 5: Gender Action Plan Monitoring

The consultant will assist the BSRDCL in ensuring that the implementation of GAP activities is in accordance with ADB requirements.

- Task (08) The Gender Expert will undertake the following:
- (i) Provide technical support to the BSRDCL in the overall implementation of the GAP and the design and monitoring framework.
 - (ii) Supervise the NGO in carrying out GAP activities, including (a) consultation campaigns on road safety; (b) awareness programs on sexually transmitted infections, health and hygiene, and human trafficking; (c) needs assessment survey to identify livelihood skills; and (d) organization of livelihood skills training programs.
 - (iii) Establish convergence with the Bihar Rural Livelihood Promotion Society (Jeevika) to facilitate livelihoods promotion among the trained community members and to enhance the employability of the local community, including girls/women, across the five highways selected.
 - (iv) Monitor GAP implementation and track the progress, and assist the BSRDCL to prepare and submit quarterly monitoring reports on GAP implementation in line with ADB reporting requirements.
 - (v) Undertake any other tasks identified by the BSRDCL during the course of project implementation.

Component 6: Authority Engineering Service

Task (09) Discharge the functions and duties of an Authority's Engineer as prescribed

3. Scope

3.1 These Terms of Reference (the "TOR") for the Authority's Engineer are being specified pursuant to the EPC Agreement dated (the "Agreement"), which has been entered into between Bihar State Road Development Corporation Ltd., RCD Mechanical Workshop Campus, Near Patna Air Port, Sheikhpura, Patna, Bihar 800014 (the "Authority") and (the "Contractor") for Consultancy services for Authority's Engineer for Supervision of Improvement / Upgradation and Strengthening of **Mansi To Fungo halt (14.125 KM) Section and Fungo Halt to Simri Bakhtiarpur(13.955 KM) Section including Major Bridges, Minor Bridges, Box Culverts and ROB etc. of Mansi-Sahrsa-Hardi Chughara**

Road (SH-95) at Khagaria and Saharsa District in the state of Bihar on EPC Mode, and a copy of which is annexed hereto and marked as Annex A to form part of this TOR.

- 3.2 The TOR shall apply to 42 Months for Construction period and 60 Months for Maintenance /DLP period of the Project Highway.

4. Definitions and interpretation

- 4.1 The words and expressions beginning with or in capital letters and not defined herein but defined in the Agreement shall have, unless repugnant to the context, the meaning respectively assigned to them in the Agreement.
- 4.2 References to Articles, Clauses and Schedules in this TOR shall, except where the context otherwise requires, be deemed to be reference to the Articles, Clauses and Schedules of the Agreement, and references to Paragraphs shall be deemed to be references to Paragraphs of this TOR.
- 4.3 The rules of interpretation stated in Clauses 1.2, 1.3 and 1.4 of the EPC Agreement shall apply, mutatis mutandis, to this TOR.

5 General

- 5.1 The Authority's Engineer shall discharge its duties in a fair, impartial, and efficient manner, consistent with the highest standards of professional integrity and Good Industry Practice.
- 5.2 The Authority's Engineer shall perform the duties and exercise the authority in accordance with the provisions of this Agreement, but subject to obtaining prior written approval of the Authority before determining.
- (a) any Time Extension.
 - (b) Any additional cost to be paid by the Authority to the Contractor.
 - (c) The Termination Payment.
 - (d) Issuance of Completion Certificate;
 - (e) Any other matter which is not specified in (a), (b) or (c) above and which creates an obligation or liability on either Party for a sum exceeding Rs. 5,000,000 (Rs. Fifty lakh.)
- 5.3 The Authority's Engineer shall submit regular periodic reports, at least once every month, to the Authority in respect of its duties and functions under this Agreement. Such reports shall be submitted by the Authority's Engineer within 10 (ten) days of the beginning of every month.
- For this purpose the Authority Engineer will undertake monthly visits by himself to the project site and ensure the inspection by himself of all major Structure/Critical Activities and submit the report to BSRDCL.
- 5.4 The Authority's Engineer shall inform the Contractor of any delegation of its duties and responsibilities to its suitably qualified and experienced personnel; provided, however, that it shall not delegate the authority to refer any matter for the Authority's prior approval in accordance with the provisions of Clauses 18.2 of EPC Agreement.
- 5.5 The Authority's Engineer shall aid and advise the Authority on any proposal for Change of Scope under Article 13 of EPC Agreement.
- 5.6 In the event of any disagreement between the Parties regarding the meaning, scope and nature of Good Industry Practice, as set forth in any provision of the Agreement, the Authority's Engineer shall specify

such meaning, scope and nature by issuing a reasoned written statement relying on good industry practice and authentic literature.

6 Role and responsibility of Officers of the Authority

The officer in-charge of the Authority e.g. CGM, BSRDCL is responsible for the overall supervision and monitoring of the execution of project as the representative of the owner of the project. The Authority's Engineer is appointed to assist the Authority for carrying out the functions as detailed under clause 18.2 of the EPC Agreement. As such, an officer of the Authority is vested with all such powers and responsibilities as are enjoined upon the Authority's Engineer and is fully competent to issue any instructions for proper monitoring and supervision of the project, either by himself or through the Authority's Engineer. Instructions issued by the concerned officer of the Authority shall have the same effect as that of the Authority's Engineer in terms of this Agreement. Wherever such concerned officer issues any instructions or notice to the Contractor, he shall endorse a copy thereof to the Authority's Engineer.

7. Construction Period

- 7.1 During the Construction Period, the Authority's Engineer shall review the Drawings furnished by the Contractor along with supporting data, including the geo-technical and hydrological investigations, characteristics of materials from borrow areas and quarry sites, topographical surveys, and the recommendations of the Safety Consultant in accordance with the provisions of Article 10 Clause 10.1.6 of EPC Agreement. The Authority's Engineer shall complete such review and send its observations to the Authority and the Contractor within 15 (fifteen) days of receipt of such Drawings; provided, however that in case of a Major Bridge or Structure, the aforesaid period of 15 (fifteen) days may be extended upto 30 (thirty) days. In particular, such comments shall specify the conformity or otherwise of such Drawings with the Scope of the Project and Specifications and Standards.
- 7.2 The Authority's Engineer shall review and approve any revised Drawings sent to it by the Contractor and furnish its comments within 10 (ten) days of receiving such Drawings. The review/ approval of drawing should be authenticated by Authority's Engineer.
- 7.3 Quality Assurance Manual and Plan forms the basis of quality of the work. It is therefore essential that the Quality Assurance Manual and Plan prepared by the EPC Contractor be checked and approved. Thus, the Authority's Engineer shall check contents of Quality Assurance Plan and Manual of EPC Contractor as per requirements of Quality Management System (as per ISO 9001), IRC: SP: 47-1998 and IRC: SP: 57-2000 for road bridges and roads respectively. The Authority's Engineer shall also offer their comments for modifying/ improving the document within a period of 21 (twenty-one) days stating the modifications, if any, required thereto. After receiving the corrected document, the Authority's Engineer shall review and formally approve the QAM and Quality Plan and send one copy to the Authority. The Authority's Engineer shall complete the review of the methodology proposed to be adopted by the Contractor for executing the Works, and convey its comments to the Contractor within a period of 10 (ten) days from the date of receipt of the proposed methodology from the Contractor.
- 7.4 The Authority's Engineer shall grant written approval to the Contractor, where necessary, for interruption and diversion of the flow of traffic in the existing lane(s) of the Project Highway for purpose of maintenance during the Construction Period in accordance with the provisions of Clause 10.4 EPC Agreement.
- 7.5 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the contractor within 7 (seven) days of receipt of such report.

7.6 On a daily basis, the concerned key personnel of Authority Engineer shall inspect the Construction Works. Following activities need to be undertaken during the visits.

- Review of construction including progress, quality and safety of construction
- Inspection of defects and deficiencies in construction works
- Witnessing quality inspection tests at labs established by EPC Contractor on a sample basis

Review of quality of work shall be done in reference to Quality Assurance Plan (QAP)/Manual and ISO 9001:2008, IRC: SP: 47-1998 and IRC: SP: 57-2000 for road bridges and roads respectively. The Authority's Engineer also needs to capture following documents and send to BSRDCL field office via email on a daily basis

- Scanned copy of filled RFI (Request for Inspection) form including commentary on 'Satisfactory/Unsatisfactory' nature of work completed by EPC Contractor
- Daily inspection report Proforma as provided in Annexure I
- Readings of quality inspection tests witnessed by the Consultant
- Minimum 6 high resolution photographs supporting the remarks made by the Authority's Engineer in RFI form

Team Leader will be responsible for sending daily emails to BSRDCL office.

7.7 On a monthly basis, the Authority Engineer shall prepare a Monthly Inspection Report in accordance with the format prescribed in Annexure V setting forth an overview of the status, progress, quality and safety of construction, including the work methodology adopted, the materials used and their sources, and conformity of Construction Works with the Scope of the Project and the Specifications and Standards. In a separate section of the Inspection Report, the Authority Engineer shall describe in reasonable detail the lapses, defects or deficiencies observed by it in the construction of the Project Highway. The Authority Engineer shall send a copy of its Inspection Report to the Authority and the EPC Contractor latest by 7th of every month. Key sections of the Monthly Progress Report are as follows.

S No.	Section	Sub-Sections
1	Executive Summary	1.1 Construction progress in current month
		1.2 Summary of strip plan
		1.3 Detailed strip plan
		1.4 Current issues and recommended actions by AE
2	Project Overview	2.1 Salient Features of the Project
		2.2 Project Milestones
		2.3 Location Map
		2.4 Key Plan
3	Critical issues and Action log	3.1 Pending issues and action log
		3.2 Obligations as per contract
4	Physical Progress	4.1 Detailed physical progress by component
		5.1 LA summary
		5.2 LA detail by CALA

5	Land Acquisition and Clearances	5.3 LA detail by village
		5.4 Manpower with each CALA
		5.5 Clearances summary
		5.6 Status of utility shifting
6	Change of Scope	6.1 Status of pending COS proposals
7	Mobilization of Resources	7.1 Resource mobilization by EPC Contractor
8	Financial Progress Details	8.1 Pen picture- Escrow
		8.2 Escrow details
9	Summary of quality control tests	9.1 Tests witnessed by AE
		9.2 Tests conducted by AE
10	Monitoring of maintenance obligations during construction phase	10.1 Critical issues and action log
		10.2 Cumulative defects and deficiencies
		10.3 Status of damages and remedial action taken by contractor.
11	Safety features	11.1 Pen picture on safety features at construction site
		11.2 Accident report
		11.3 Compliance of the recommendation made by safety Engineer.
12	Annexures	Annex 1: Detailed list of physical components as per Schedule G
		Annex 2 onwards: Additional details provided by AE
13	S-Curve	S-Curve of the Project
14	List of Letter	List of outgoing and incoming letters

7.8 If at any time during the Construction Period, the Authority Engineer determines that the Contractor has not made adequate arrangements for the safety of workers and Users in the zone of construction or that any work is being carried out in a manner that threatens the safety of the workers and the Users, it shall make a recommendation to the Authority forthwith, identifying the whole or part of the Construction Works that should be suspended for ensuring safety in respect thereof.

7.8 The Authority's Engineer shall conduct the pre-construction review of manufacturer's reports and standard samples of manufactured Materials, and such other Materials as the Authority's Engineer may require.

7.9 For determining that the Works conform to Specifications and Standards, the Authority's Engineer shall require the Contractor to carry out, or cause to be carried out, tests at such time and frequency and in such manner as specified in the Agreement and in accordance with Good Industry Practice for quality assurance. For purposes of this, the tests specified in the IRC Special Publication-11 (Handbook of Quality Control for Construction of Roads and Runways) and the Specifications for Road and Bridge Works issued by MORT&H (the "Quality Control Manuals") or any modifications/substitution thereof shall be deemed to be tests conforming to Good Industry Practice for quality assurance.

- 7.10 The Authority's Engineer shall test check ~~at least~~ 100 (Hundred) ~~60 (sixty)~~ percent of the quantity or number of tests prescribed for each category or type of test for quality control by the Contractor.
- 7.11 The timing of tests referred to in Paragraph 5.10, and the criteria for acceptance/rejection of their results shall be determined by the Authority's Engineer in accordance with the Quality Control Manuals. The tests shall be undertaken on a random sample basis and shall be in addition to, and independent of, the tests that may be carried out by the Contractor for its own quality assurance in accordance with Good Industry Practice.
- 7.12 In the event that results of any tests conducted under Clause 11.10 of EPC Agreement establish any Defects or deficiencies in the Works, the Authority's Engineer shall require the Contractor to carry out remedial measures.
- 7.13 The Authority's Engineer may instruct the Contractor to execute any work which is urgently required for the safety of the Project Highway, whether because of an accident, unforeseeable event or otherwise; provided that in case of any work required on account of a Force Majeure Event, the provisions of Clause 21.6 of EPC Agreement shall apply.
- 7.14 In the event that the Contractor fails to achieve any of the Project Milestones, the Authority's Engineer shall undertake a review of the progress of construction and identify potential delays, if any. If the Authority's Engineer shall determine that completion of the Project Highway is not feasible within the time specified in the Agreement, it shall require the Contractor to indicate within 15 (fifteen) days the steps proposed to be take to expedite progress, and the period within which the Project Completion Date shall be achieved. Upon receipt of a report from the Contractor, the Authority's Engineer shall review the same and send its comments to the Authority and the Contractor forthwith.
- 7.15 The Authority's Engineer shall obtain from the Contractor a copy of all the Contractor's quality control records and documents before the Completion Certificate is issued pursuant to Clause 12.2 of EPC Agreement.
- 7.16 Authority's Engineer may recommend to the Authority suspension of the whole or part of the Works if the work threatens the safety of the Users and pedestrians. After the Contractor has carried out remedial measure, the Authority's Engineer shall inspect such remedial measures forthwith and make a report to the Authority recommending whether or not the suspension hereunder may be revoked.
- 7.17 In the event that the Contractor carries out any remedial measures to secure the safety of suspended works and users, and requires the Authority's Engineer to inspect such works, the Authority's Engineer shall inspect the suspended works within 3 (three) days of receiving such notice, and make a report to the Authority forthwith, recommending whether or not such suspension may be revoked by the Authority.
- 7.18 The Authority's Engineer shall carry out, or cause to be carried out, all the Tests specified in Schedule-K and issue a Completion Certificate or Provisional Certificate as the case may be. For carrying out is functions under this Paragraph 5.18 and all matters incidental thereto, the Authority's Engineer shall act under and in accordance with the provisions of Article 12 and Schedule-K. The Authority's Engineer shall use following equipment in carrying out the tests.

S.N	Key metrics of Asset	Equipment to be used
1	Surface defects of pavement	Network Survey Vehicle (NSV)
2	Roughness of pavement	Laser Profilometer
3	Strength of pavement	Falling Weight Reflectometer (FWD)
4	Bridges	Bridge Inspection using Mobile Bridge Inspection Unit or any

		suitable equipment.
5	Road signs and road markings	Retro-reflectometer

7.19 The Authority's Engineer shall review the monthly progress report furnished by the Contractor and send its comments thereon to the Authority and the contractor within 7 (seven) days of receipt of such report. Ensure the submission of MPR from the Contractor and make comment on the same with a copy to Employer. Consultant shall also ensure the compliance status of the comments made in earlier MPR and should also be made as a part of Consultant MPR. Payment of Consultancy services shall only be made upon the above compliance.

7.20 Authority's Engineer is expected to get delivered the project within the scheduled Construction Period, financial implications incurred due to any delay on account of Authority Engineer in Completion of the Project shall be borne by the Authority Engineer and no Claims in this regard shall be entertained by the Authority.

8. Maintenance Period

8.1 The Authority's Engineer shall aid and advise the Contractor in the preparation of its monthly Maintenance Programme and for this purpose carry out a joint monthly inspection with Contractor.

8.2 The Authority's Engineer shall undertake regular inspections, at least once every month to evaluate compliance with the Maintenance Requirements and submit a Maintenance Inspection Report to the Authority and the Contractor.

8.3 Visual Inspection of project highway

8.3.1 The Authority Engineer shall carry out visual inspection of entire highway stretch as per the frequency defined in the following table

Nature of defect or deficiency		Frequency of inspection
ROADS		
(a)	Carriageway and paved shoulders	
(i)	Breach or blockade	Daily
(ii)	Pot holes	Daily
(iii)	Cracking	Weekly
(iv)	Rutting	Weekly
(v)	Bleeding/skidding	Weekly
(vi)	Ravelling/Stripping of bitumen surface	Weekly
(vii)	Damage to pavement edges	Weekly
(viii)	Removal of debris	Daily
(b)	Hard/earth shoulders, side slopes, drains and culverts	
(i)	Variation by more than 2% in the prescribed slope of camber/cross fall	Weekly
(ii)	Edge drop at shoulders	Weekly
(iii)	Variation by more than 15% in the prescribed side (embankment) slopes	Weekly
(iv)	Rain cuts/gullies in slope	Weekly

(v)	Damage to or silting of culverts and side drains during and immediately preceding the rainy season	Weekly
(vi)	Desilting of drains in urban/semi-urban areas	Daily
(c)	Road side furniture including road signs and pavement marking	
(i)	Damage to shape or position; poor visibility or loss of retro-reflectivity	Daily
(d)	Street lighting and telecom (ATMS)	
(i)	Any major failure of the system	Daily
(ii)	Faults and minor failures	Daily
(iii)	Streetlight with Lux Meter	Weekly
(e)	Trees and plantation	
(i)	Obstruction in a minimum head-room of 5 m above carriageway or obstruction in visibility of road signs	Daily
(ii)	Deterioration in health of trees and bushes	Weekly
(iii)	Replacement of trees and bushes	Weekly
(iv)	Removal of vegetation affecting sight line and road structures	Weekly
(f)	Rest areas/Wayside amenities	
(i)	Cleaning of toilets	Daily
(ii)	Defects in electrical, water and sanitary installations	Daily
(g)	Toll plaza[s]	
(i)	Failure of toll collection equipment including ETC or lighting	Daily
(ii)	Damage to toll plaza	Weekly
(h)	Other Project Facilities and Approach roads	
(i)	Damage or deterioration in Approach Roads, [pedestrian facilities, truck lay-bys, bus-bays, bus- shelters, cattle crossings, Traffic Aid Posts, Medical Aid Posts and other work]	Daily
(j)	Incident Management	
Nature of defect or deficiency		Frequency of inspection
(i)	Instances of Incident Management as reported including time of call, response time, services rendered and time of clearing of the Highway.	Daily
(ii)	List of the Incident Management Services rendered.	Weekly
BRIDGES		
(a)	Superstructure of bridges	
(i)	Cracks	Weekly
(ii)	Spalling/scaling	Weekly
(b)	Foundations of bridges	
(i)	Scouring and/or cavitation	Weekly

(c)	Piers, abutments, return walls and wing walls of bridges	
(i)	Cracks and damages including settlement and tilting	Weekly
(d)	Bearings of bridges	
(i)	Deformation	Weekly
(e)	Joints in bridges	
(i)	Loosening and malfunctioning of joints	Weekly
(f)	Other items relating to bridges	
(i)	Deforming of pads in elastomeric bearings	Weekly
(ii)	Gathering of dirt in bearings and joints; or clogging of spouts, weep holes and vent-holes	Weekly
(iii)	Damage or deterioration in parapets and handrails	Weekly
(iv)	Rain-cuts or erosion of banks of the side slopes of approaches	Weekly
(v)	Damage to wearing coat	Weekly
(vi)	Damage or deterioration in approach slabs, pitching, apron, toes, floor or guide bunds	Weekly
(vii)	Growth of vegetation affecting the structure or obstructing the waterway	Weekly

8.3.2 All elements which have daily inspection frequency shall be inspected weekly as well. Similarly, all elements which have weekly inspection frequency shall be inspected monthly as well.

8.3.3 Daily inspection report format and weekly inspection report format has been provided in Annexure II and III of this document respectively. Manpower which needs to conduct visual inspection and mode of reporting is defined in the following table

Frequency of inspection	Inspection to be carried out by	Mode of reporting
Daily	Sub-professional staff	Soft copy by Email
Weekly	Key personnel	Soft copy by Email
Monthly	Key personnel	Hard copy and Soft copy

8.3.4 High resolution photographs and video of the highway stretches having defects and/or deficiencies shall be submitted along with Weekly Inspection Report and Monthly Status Report. Summary of key observations around defects and deficiencies in highway stretch shall be reported in Monthly Progress Report and detailed inspection report shall be provided as Annexure to Monthly Progress Report.

8.3.5 The Authority's Engineer shall also be responsible for inspection and monitoring of Wayside Amenities and ATMS (Advanced Traffic Management System) and incident management.

8.4 Road conditions surveys

8.4.1 The carrying out of condition surveys will be one of the most important and crucial field tasks under the project. The Authority Engineer shall carry out condition surveys using equipment and following a frequency as defined under.

S No	Key metrics of Asset	Equipment to be used	Frequency of condition survey
1	Surface defects of pavement	Network Survey Vehicle (NSV)	At least twice a year (As per survey months defined for the state basis rainy season)
2	Roughness of pavement	Laser Profilometer	At least twice a year (As per survey months defined for the state basis rainy season)
3	Strength of pavement	Falling Weight Deflectometer (FWD)	At least once a year
4	Bridges	Bridge Inspection using Mobile Bridge Inspection Unit or any suitable equipment	At least once a year (As per survey months defined for the state basis rainy season)
5	Road signs	Retro-reflectometer	At least twice a year (As per survey months defined for the state basis rainy season)

The first equipment based inspection except under sl. no. 1 shall be conducted at the time of completion testing. The other inspections shall be conducted before and after the rainy seasons except for FWD testing which shall be conducted once a year.

Calibration of equipment, wherever needed, is required to be done in presence of Competent Authority. Once approval of equipment, the settings and a sample data set is provided by Competent Authority, network level data for entire project stretch can be collected. Month of surveys for Bihar shall be done before rains in the month of May and after rains in the month of November as defined in Annexure-IV of this document.

The project road shall necessarily be surveyed with NSV before the start of the work, issue of completion certificate and thereafter at regular intervals for each lane of the pavements as provided in the above table with minimum parameters as under.

The minimum parameter which has to be recorded during survey with NSV in each lane, not limited to the following:

(i) Inventory of Road;

GPS coordinates, Pavement Type, Pavement Width, Terrain, Land use, Shoulder type and width, Drain Type and Width, Median Type and Width, Wayside Amenities, Crash Barrier, Signages etc.

(Note-All inventory items shall be recorded both side of road and Geo-tagged with images)

(ii) Condition of Road;

Roughness, Rutting, Distresses (cracking, Potholes, Bleeding, Surface failure etc.);

(Note-All inventory items shall be recorded for each lane and Geo-tagged)

8.4.2 Measurement of pavement surface defects and roughness

- i. The Authority Engineer shall use Network Survey Vehicles mounted with equipment such as Laser based automatic crack detection , high resolution digital cameras for RoW and pavement, high accuracy DGPS receiver and in vehicle data processing software or better technology to accurately measure following pavement surface properties

Surface defect	Dimensions to be reported
Cracking	<ul style="list-style-type: none"> • Length • Width • Depth
Potholes	<ul style="list-style-type: none"> • Area • Depth
Raveling	<ul style="list-style-type: none"> • Indicator
	<ul style="list-style-type: none"> • % • Area
Rutting	<ul style="list-style-type: none"> • Depth • Width
Concrete Joint/ Faulting	<ul style="list-style-type: none"> • Length
Roughness	<ul style="list-style-type: none"> • IRI in both wheel paths

- ii. The following criteria shall be met by the process of defects detection
- Measurement of 3D road profile using such technologies as laser scanning or other proven technologies.
 - Ability to operate (collect data) at different speeds with a minimum speed of 30km/hr and upto at least 75 km/ hr.
 - Profile depth accuracy of 0.5mm
 - Capability for lane tracking to control driver wander' and ensure high repeatability of data between surveys.
 - Measure at least 3.5m width of highway lane.
 - Transverse Profile including rut depth measurement of pavement surface widths of both carriageway and shoulders. The rut depth data must be convertible to different straightedge lengths (1.8m to 3.5m) and meet industry standards (ASTM E1703 / E1703M).
 - Pavement images with capability to automatically identify and rate distresses
 - Roughness measurement with outputs of both raw longitudinal profiles and International Roughness Index (IRI) calculation shall be reported at least 100m referenced to the preceding Location Reference Post (LRP). The roughness must meet ASTM-E950 (equivalent to Class I road profiler). The IRI shall be determined in both wheel paths.
 - Ability to record images at user-defined intervals (e.g. every 5, 10m, etc.)
 - Minimum images resolution of 1600x1200
 - Outputs must include Standard JPEG image or similar industry standard
 - Distance resolution of <1mm,
 - Capable of achieving distance accuracy of 0.1% (i.e. within 1m over 1km distance)
 - All data outputs should be in a non-proprietary format (e.g. .CSV, .MDB, Excel) and not require specialist software in order to view or format data
 - Data should also be capable of being easily formatted into data compatible with HDM-4

- iii. The following are the set of deliverables which should be submitted after completion of survey as part of Monthly Progress Report
- Raw data generated from the equipment which are part of Network Survey covering the parameters mentioned in above table. It should also include
 - o Survey ID, Description, Date, Lane
 - o GPS referenced data for GIS mapping
 - Video logging
 - o Pavement imagery (AVI/JPEG)
 - o 360 degree imagery (JPEG)
 - Interpretation report covering summary of entire survey and analysis of defects and deficiencies

8.4.3 Measurement of pavement strength

- (i) The Authority Engineer shall carry out structural strength surveys for existing pavements using Falling Weight Deflectometer technique in accordance with the procedure given in IRC:115-2014 (Guidelines for Structural Evaluation and Strengthening of Flexible Road Pavements Using Falling Weight Deflectometer (FWD) Technique) and IRC: 117-2015 (Guidelines for the Structural Evaluation of Rigid Pavement by Falling Weight Deflectometer)
- (ii) The interval at which deflection measurements are to be taken up are as per IRC:115-2014 / IRC:117-2015. For flexible pavements, the sample size and the interval of the data to be collected depends on the length of the uniform section calculated and condition of the pavement section i.e. 'good', 'fair' and 'poor' for each lane, established on the pavement condition data based on the criterion given in IRC:115-2014. For rigid pavements, the deflection data may be collected at interiors, corners, transverse joints and longitudinal joints in the outer lanes at intervals as specified in IRC:117-2015.
- (iii) The following are the set of deliverables which should be submitted after completion of inspection test as part of Monthly Progress Report
- Data report covering following parameters
 - Deflection Bowl (Transient Deflections at seven different points)
 - Corrected Elastic Modulus Bituminous E1
 - Corrected Elastic Modulus Granular E2
 - Corrected Elastic Modulus Subgrade E3
 - Subgrade CBR
 - Interpretation report covering summary of entire survey results and analysis of key parameters

8.4.4 The Authority Engineer shall carry out the condition and structural assessment survey of the bridges in accordance with IRC-SP; 35 with the use of Mobile Bridge Inspection unit (MBIU) or better technology.

- (i) The following criteria shall be met by the process of bridge condition assessment
- Automatic folding and unfolding of platform
 - 90 degree rotation of platform
 - Sufficient safety features to be incorporated such as dedicated power supply, emergency cut off system, etc
 - Complete access to hidden parts of the bridge by the raters
- (ii) Detailed bridge inspection report shall be submitted as per the Inspection Proforma provided in IRC-SP 35

8.4.5 Measurement of retroreflection of road signs

- (i) The Authority Engineer shall measure Coefficient of retro reflected luminance RA (night time retro reflection) of road traffic signs using a portable retro reflectometer.
- (ii) The following criteria shall be met by the process of road signs retro reflection measurement
 - Measurement of retro reflective signs shall be conducted in accordance with ASTM E1709 and ASTM E2540
 - Measurement time after pressing trigger shall be less than or equal to 1 sec
 - Observation angle adjustment from 0.2 degrees to 2.0 degrees
 - Entrance angle adjustment from -45 degrees to +45 degrees
 - Self-contained commercially available battery
 - Inbuilt data storage of at least 2,000 measurements so that data transfer requirement is minimized while the survey is being conducted
 - Interface for transferring data from device to Computer
 - Built in GPS to capture GPS coordinates of road sign
 - Range shall be at least 0-2000 cd/lx/m²
- (iii) The following are the set of deliverables which should be submitted after completion of survey as part of Monthly Progress Report
 - System generated coefficient of retro reflected luminance RA (night time retro reflection) of all road signs
 - Interpretation report covering analysis of road signs falling in different range of RA and actions to be taken

8.5 The Authority Engineer shall prepare a Monthly Status Report in O&M phase of project in respect of its duties and functions under this Agreement and in accordance with the format prescribed in Annexure VI. 1st deliverable of the report which is an executive summary to the main report (Section 1) shall be submitted to the Authority and updated on the PMIS and project specific website by 4th of every month. Main report (Section 2 onwards) shall be submitted to the Authority and updated on the PMIS and project specific website by 7th of every month. Key sections of the Monthly Status Report are as follows;

S.No	Sections	Sub sections
1	Executive Summary	1.1 Overall road condition
		1.2 Key reporting metrics
		1.3 Key maintenance activities undertaken
		1.4 Pending issues
		1.5 Recommended actions by AE
		1.6 Strip plan for maintenance
2	Project Overview	2.1 Key project details
		2.2 Location map
		2.3 Key plan

		2.4 Summary of project features
		2.5 RoW availability
3	Critical issues and action taken	3.1 Issue and action log
		3.2 Summary of deficiencies
		3.3 Obligations as per contract
		3.4 Inspection schedule
4	Monthly Inspection Report	4.1 Summary of NCR issued
		4.2 Equipment based inspection report
5	Status of damages	6.1 Damages for non completion of project facilities
		6.2 Damages for breach of maintenance activities
		6.3 Damages for non completion of major maintenance works
6	Change of Scope proposals	7.1 Change of Scope proposals
7	Status of pending disputes	8.1 Status of pending disputes
8	Reports	9.1 Toll collection statement
		9.2 Accident Report
		9.3 Details of user complaints
		9.4 Encroachment list
		9.5 Lane closure report
9	Annexures	Annex I- Detailed visual inspection report of project highway
		Annex II onwards- Additional details provided by AE

- 8.6 The Authority's Engineer shall specify the tests, if any, that the Contractor shall carry out, or cause to be carried out, for the purpose of determining that the Project Highway is in conformity with the Maintenance Requirements. It shall monitor and review the results of such tests and remedial measures, if any, taken by the Contractor in this behalf.
- 8.7 In respect of any defect or deficiency referred to in Paragraph 3 of Schedule-E, the Authority's Engineer shall, in conformity with Good Industry Practice, specify the permissible limit of deviation or deterioration with reference to the Specifications and Standards and shall also specify the time limit for repair or rectification of any deviation or deterioration beyond the permissible limit.
- 8.8 The Authority's Engineer shall examine the request of the Contractor for closure of any lane (s) of the Project Highway for undertakings maintenance/repair thereof, and shall grant permission with such modifications, as it may deem necessary, within 5 (five) days of receiving a request from the Contractor. Upon expiry of the permitted period of closure, the Authority's Engineer shall monitor the reopening of such lane (s), and in case of delay, determine the Damages payable by the Contractor to the Authority under Clause 14.5 of EPC Agreement

9. Determination of costs and time

- 9.1 The Authority's Engineer shall determine the costs, and/or their reasonableness, that are required to be determined by it under the Agreement.

- 9.2 The Authority's Engineer shall determine the period of Time Extension that is required to be determined by it under the Agreement.
- 9.3 The Authority's Engineer shall consult each Party in every case of determination in accordance with the provisions of Clause 18.5 of EPC Agreement.

10. Payments

- 10.1 The Authority's Engineer shall withhold payments for the affected works for which the Contractor fails to revise and resubmit the Drawings to the Authority's Engineer in accordance with the provision of Clause 10.2.4 (d) of EPC Agreement.
- 10.2 Authority's Engineer shall
- within 10 (ten) days of receipt of the Stage Payment Statement from the Contractor pursuant to Clause 19.4, determine the amount due to the Contractor and recommend the release of 90 (ninety) percent of the amount so determined as part payment, pending issue of the Interim Payment Certificate; and
 - within 15 (fifteen) days of the receipt of the Stage Payment Statement referred to in Clause 19.4, deliver to the Authority and the Contractor an Interim Payment Certificate certifying the amount due and payable to the Contractor, after adjustments in accordance with the provisions of Clause 19.10 of EPC Agreement.
- 10.3 The Authority's Engineer shall, within 15 (fifteen) days of receipt of the Monthly Maintenance Statement from Contractor pursuant to Clause 19.6 of EPC Agreement, verify the Contractor's statement and certify the amount to be paid to the Contractor in accordance with the provisions of the Agreement.
- 10.4 The Authority's Engineer shall certify final payment within 30 (thirty) days of the receipt of the final payment statement of Maintenance in accordance with the provision of Clause 19.16 of EPC Agreement.

11. Other duties and functions

The Authority's Engineer shall perform all other duties and functions as specified in the Agreement.

12. Miscellaneous

- 12.1 All key personnel and non-key personnel (sub professional and support staff) of the Supervision Consultant shall use the fingerprint based (biometric) attendance system for marking their daily attendance. Biometric Attendance System shall be installed by the Supervision Consultant at its own cost at the site office and Team Leader Office in order to facilitate the attendance marking. 1 More system can be installed near the project highway in order to encourage frequent visits of project highway by key personnel and sub professional staff. A copy of monthly attendance records shall be attached with Monthly Progress Report. Proper justification shall be provided for cases of absence of key personnel/ non-key personnel which do not have prior approval from BSRDCL HQ. for key personnel and concerned DGM, PIU for non-key personnel.
- 12.2 A copy of all communications, comments, instructions, Drawings or Documents sent by the Supervision Consultant to the Contractor pursuant to this TOR, and a copy of all the test results with comments of the Supervision Consultant thereon including NCR on monthly basis, shall be furnished by the Supervision Consultant to the client forthwith.
- 12.3 The Authority's Engineer shall retain at least one copy each of all Drawings and Documents received by it, including 'as - built' Drawings and keep them in its safe custody.

- 12.4 Within 90 (Ninety) days of the Project Completion Date, the Authority's Engineer shall obtain a complete set of as built Drawings in 2 (two) hard copies and in micro film form or in such other medium as may be acceptable to the Authority, reflecting the Project Highway as actually designed, engineered and constructed, including an as-built survey illustrating the layout of the Project Highway and setback lines, if any, of the buildings and structures forming part of project Facilities; and shall hand them over to the Authority against receipt thereof.
- 12.5 The Authority's Engineer, if called upon by the Authority or the Contractor or both, shall mediate and assist the Parties in arriving at an amicable settlement of any Dispute between the Parties.
- 12.6 The Authority's Engineer shall inform the Authority and the Contractor of any event of Contractor's Default within one week of its occurrence.
- 12.7 As soon as level of OGL/NGL is recorded, a copy of the same duly signed by Team Leader and PE shall be submitted to PIUs with a copy to BSRDCL, HQ before the commencement of clearing & grubbing for record and its checking with the levels to be provided in the As Built Drawings

12.8 Fake CV

If any case of fake/incorrect/inflated CV is found, it shall be dealt with very severely and would result in all possible penal action including blacklisting from future projects

of BSRDCL. This would also apply even when the consulting firm is not successful in getting the assignment. In case CV of a person is turned out to be fake/incorrect/inflated during the assignment, the consultancy firms will have to refund the salary and perks drawn including interest @12% per annum in respect of the person apart from other consequences. In addition to above, 10% of the salary and perks to be refunded shall be recovered from the firm as penalty.

13. PERFORMANCE CLAUSE

Authority's Engineers shall be expected to fully comply with all the provisions of the 'Terms of Reference', and shall be fully responsible for supervising the Designs, Construction and maintenance and operation of the facility takes place in accordance with the provisions of the EPC Agreement and other schedules. Any failure of the Authority's Engineer in notifying to Employer and the Contractor on non-compliance of the provisions of the EPC Contract Agreement and other schedules by the EPC Contractor, non-adherence to the provision of ToR and non-adherence to the time schedule prescribed under ToR shall amount to non-performance and shall be treated as deficiency of services.

The Authority Engineer shall appoint its authorized representative, who shall issue on behalf of the AE, Completion Certificate along with the Team Leader and shall carry out

any such task as may be decided by Employer. The AE shall take prior approval of Employer before issuing Completion Certificate. The proposal submitted shall also include the name of the authorized representative along with the authorization letter and power of attorney.

The completion certificate shall be issued by the Authority's Engineer with the prior approval of Authority. Authority shall also ensure that the completion certificate is approved after verifying/confirming that all works/items including ancillary items forming part of the project Highway are completed in all respects conforming to the Standard and Specifications of the Ministry. A video of

completed work on the date of completion shall invariably be prepared and furnished as an authentic documentary evidence of completion of works within 15 days of completion without which completion certificate shall not be issued. Authority Engineer, apart from furnishing a certificate of completion and all tests as per specifications in accordance with contract, will also certify that all NCRs issued during the contract have been closed after successful rectification of defects within the completion date.

14. Deficiency of Services:

Deficiencies in the services on part of supervision consultants may attract penal provisions in the form of fines, up to a maximum amount of 10% of contract price and/or debarment, blacklisting etc. by the client. Client shall have the right to communicate to all the Department/Govt./ Agencies inside the state and outside the state regarding action initiated against the consulting firm regarding their inferior services. Sample deficiencies include but are not limited to the following:

- Not acting impartially or acting in collusion with contractor in award of variation, fixation of new rates, etc.
- Not keeping proper records regarding quality control, inspection, rejection/ rectification of work, etc.
- Failure to give proper and timely advice to client/contractor to enable correction during execution.
- Delay in design and withholding approvals, etc. beyond the period mentioned in this TOR for such action.
- Recommending extension to the contractor with a view to extending duration of supervision services.
- Discrepancies found regarding Quality Control Results data.
- Refusing to give reasons for decisions when called for by the client.
- Not being fully conversant with manuals, specifications, standards, client's/ Ministry's guidelines and requirement of the project to be followed during construction.
- Certifying substandard work for payment.
- Not exercising required scrutiny/non approval of temporary stretch/works.
- Lack of proper coordination with contractors and Project Manager/ client's representative to ensure smooth implementation of projects.
- Permitting subletting of any part/ major works without authorisation.
- Delay in mobilisation of required staff at any stage of the contract.
- Indulging in corrupt, fraudulent, coercive or collusive practices.

15. CONSULTANT'S PROPOSAL

15.1 List of key personnel and non key expert to be fielded by the Consultants shall be as below:

Key Expert	
1	Team Leader Cum Senior Contract Specialist
2	Senior Bridge Engineer
3	Senior Highway cum Pavement Engineer
4	Senior Quality cum Material Expert
5	Road safety Expert
6	Senior Quantity Surveyer cum Contract Specialist
7	R&R cum Social Development Specialist
8	Environmental Specialist
9	Resident Engineer, Bridge
10	Resident Engineer, Highway
11	CAD Engineer
12	Gender Expert

Non Key Expert	
1	Quantity Surveyor (2 Nos)
2	Field Engineer Survey (3 Nos)
3	Field Engineer (Highway) (2 Nos)
4	Field Engineer (Bridge). (4 Nos)
5	Junior Environmental Expert (1 Nos)
6	Material Engineer/ Quality Control Engineer (2 Nos.)
7	Lab Technician 2 Nos

15.2 Broad job-description and minimum qualification for key personnel mentioned above is enclosed as **Enclosure-B**. However, higher marks shall be accorded to the Candidate with higher relevant qualification and experience. All the CV's of the personals mentioned in Para 5.3 (iii) of Data Sheet shall be evaluated at the time of evaluation of technical proposal. Consultants are advised in their own interest to frame the technical proposal in an objective manner as far as possible so that these could be properly assessed in respect of points to be given as part of evaluation criteria. The bio-data of the key personnel should be signed on every sheet by the personnel concerned and the last sheet of each bio-data should also be signed by the authorised signatory for the Consultant. The key personnel shall also certify at the end of their bio-data proforma that they have not left any of the Employer works without completing of their assignment and have not accepted any other offer at the time of signing of the bio-data and as such shall be available to work with the Authority Engineer,

if the Project is awarded. In case the key personnel leaves the assignment without approval of Employer, Employer would be at liberty to take any appropriate action against that key personnel including debarment. The CV submitted by selected firm/JV shall be hoisted on official website of Employer.

- 15.3 In addition to above, consultants are required to propose other key personnel, sub- professional staff and other field engineers as detailed in Enclosure-A and the minimum qualification requirements for the same is enclosed in Enclosure–B.

16. PERIOD OF SERVICES

- 16.1 The services of an Authority’s Engineer will be in phases as per Contract Agreement.
16.1.1 The appointment of the Authority’s Engineer shall initially be as per details given below.

Period of service (in months)	Construction period (in months)	Maintenance /DLP (in months)
42+60	42	60

The proposed manpower deployment for this period shall be matching the activities to be performed during the said period. The time frame for services during the deployment of key personnel during this period shall be as shown in Enclosure A. Extension of Time for providing services of the Authority’s Engineer may be extended concurrently with the Extension of Time granted, if any, to the EPC Contractor for the project, subject to satisfactory performance of the Authority’s Engineer.

17. Project Coordinator –

The Authority's Engineer shall also act as Project Co-ordinator.

The Firm shall appoint a personnel from its head office to act as Project Coordinator for the assignment. He will be authorised to communicate with the Authority in respect of all matters pertaining to the project. The cost of the Project Coordinator shall be incidental to the Consultancy Assignment. Personnel representing the firm will act as an Authority's Engineer also. Such Personnel should have more professional experience than the project Team Leader and having the experience of handling EPC/PPP/Externally Aided Project Contract and should be employed with the Company/Firm for more than 2 years at the top management level. In this regard an undertaking needs to be submitted with the Technical Proposal.

Authority’s Engineer shall be from the lead partner firm.

18. Performance Security

Consultant shall be required to submit acceptable Bank Guarantee for an amount equal to 10% (ten percent) of the accepted consultancy cost towards Performance Security proportionately in the currencies of payment asked for in the bid proposal. The validity of the Bank Guarantee(s) shall cover entire duration of consultancy period plus 6 months. The format of the Bank Guarantee(s) shall be got approved by the consultant from Employer. The

Bank Guarantee(s) shall be released after satisfactory completion of the assignment and submission of final bill of the civil contractors.

SCHEDULE - O

(See Clauses 19.4(i), 19.6(i), and 19.8(i))

Forms of Payment Statements

1. Stage Payment Statement for Works

The Stage Payment Statement for Works shall state:

- (a) the estimated amount for the Works executed in accordance with Clause 19.3(i) subsequent to the last claim;
- (b) amounts reflecting adjustments in price for the aforesaid claim;
- (c) the estimated amount of each Change of Scope Order executed subsequent to the last claim;
- (d) amounts reflecting adjustment in price, if any, for (c) above in accordance with the provisions of Clause 13.2(iii) (a);
- (e) total of (a), (b), (c) and (d) above;
- (f) Deductions:
 - (i) Any amount to be deducted in accordance with the provisions of the Agreement except taxes;
 - (ii) Any amount towards deduction of taxes; and
 - (iii) Total of (i) and (ii) above.
- (g) Net claim: (e) – (f) (iii);
- (h) The amounts received by the Contractor up-to the last claim:
 - (i) For the Works executed (excluding Change of Scope orders);
 - (ii) For Change of Scope Orders, and
 - (iii) Taxes deducted

2. Monthly Maintenance Payment Statement

The monthly Statement for Maintenance Payment shall state:

- (a) the monthly payment admissible in accordance with the provisions of the Agreement;
- (b) the deductions for maintenance work not done;
- (c) net payment for maintenance due, (a) minus (b);
- (d) amounts reflecting adjustments in price under Clause 19.12; and
- (e) amount towards deduction of taxes

3. Contractor's claim for Damages

Note: The Contractor shall submit its claims in a form acceptable to the Authority.

SCHEDULE – P
(See Clause 20.1)

Insurance

1. Insurance during Construction Period

- (i) The Contractor shall effect and maintain at its own cost, from the Appointed Date till the date of issue of the Completion Certificate, the following insurances for any loss or damage occurring on account of Non Political Event of Force Majeure, malicious act, accidental damage, explosion, fire and terrorism:
- (a) insurance of Works, Plant and Materials and an additional sum of 15 (fifteen) per cent of such replacement cost to cover any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature; and
 - (b) insurance for the Contractor's equipment and Documents brought onto the Site by the Contractor, for a sum sufficient to provide for their replacement at the Site.
- (ii) The insurance under sub para (a) and (b) paragraph 1(i) shall cover the Authority and the Contractor against all loss or damage from any cause arising under paragraph 1.1 other than risks which are not insurable at commercial terms.

2. Insurance for Contractor's Defects Liability

The Contractor shall effect and maintain insurance cover of not less than 15% of the Contract Price for the Works from the date of issue of the Completion Certificate until the end of the Defects Liability Period for any loss or damage for which the Contractor is liable and which arises from a cause occurring prior to the issue of the Completion Certificate. The Contractor shall also maintain other insurances for maximum sums as may be required under the Applicable Laws and in accordance with Good Industry Practice.

3. Insurance against injury to persons and damage to property

- (i) The Contractor shall insure against its liability for any loss, damage, death or bodily injury, or damage to any property (except things insured under Paragraphs 1 and 2 of this Schedule or to any person (except persons insured under Clause 20.9), which may arise out of the Contractor's performance of this Agreement. This insurance shall be for a limit per occurrence of not less than the amount stated below with no limit on the number of occurrences.
- The insurance cover shall be not less than: Rs. 10,00,000 (Ten Lakh).
- (ii) The insurance shall be extended to cover liability for all loss and damage to the Authority's property arising out of the Contractor's performance of this Agreement excluding:
- (a) the Authority's right to have the construction works executed on, over, under, in or through any land, and to occupy this land for the Works; and
 - (b) damage which is an unavoidable result of the Contractor's obligations to execute the Works.

4. Insurance to be in joint names

The insurance under paragraphs 1 to 3 above shall be in the joint names of the Contractor and the Authority.

Schedule-Q**(see clause 14.10)****Tests on completion of Maintenance Period****1. Riding Quality Test:**

Riding quality test: Riding quality of each lane of the carriageway shall be checked with the help of a calibrated bump integrator and the maximum permissible roughness for the purpose of this test shall be 2,200 (two thousand two hundred only) mm for each km.

2. Visual and Physical test

The Authority's Engineer shall conduct a visual and physical check of construction to determine that all works and equipment forming part thereof conform to the provision of this Agreement. The physical test shall include measurement of cracking, rutting, stripping and potholes and shall be as per the requirement maintenance mentioned in Schedule-E

Schedule-R

(See clause 14.10)

Taking Over Certificate

I,-----[name and designation of the Authority's Representative] under and in accordance with the Agreement dated -----[the "Agreement"], for **Improvement/Upgradation, Widening and Strengthening of Fungo Halt –Simri Bakhtiyarpur Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95), Section-II(KM 14+125 to KM 28+080) in the State of Bihar on EPC Mode under Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95** through -----[name of Contractor], hereby certify that the Tests on completion of Maintenance Period in accordance with Article 14 of the Agreement have been successfully undertaken to determine compliance of the Project Highway with the provisions of the Agreement and I hereby certify that the Authority has taken over the Project highway from the Contractor on this day-----

SIGNED, SEALED AND DELIVERED

[Signature]

[name and designation of Authority 's Representative]

[Address]

SCHEDULE-S

(See Clause 17.6.2)

Performance Certificate

I,.....(Name and designation of the Authority's representative) under and in accordance with the Agreement dated..... (the "Agreement"), for **Improvement/Upgradation, Widening and Strengthening of Fungo Halt –Simri Bakhtiyarpur Section of Mansi- Saharsa-Hardi Chaughara Road (SH-95), Section-II(KM 14+125 to KM 28+080) in the State of Bihar on EPC Mode under Civil Works Contract Package No. BSHP-III (Phase-2)/Pkg-3/SH-95** (the "Project Highway") through..... (Name of Contractor), hereby certify that the Contractor has discharged all its obligations under the Agreement and in accordance with Article 17 of the Agreement I hereby issue Performance Certificate to the Contractor on this day.....

SIGNED, SEALED AND DELIVERED

[Signature]

[name and designation of Authority 's Representative]

[Address]

SCHEDULE-T

(Clause 19.1.6)

Summary of Currencies of Payment

Name of Currency	A	B	C	D
	Amount of currency	Rate of exchange (local currency per unit of foreign)	Local currency equivalent $C=AX B$	Percentage of Net Bid Price(NTP) $(100 \times C)/NTP$
Local Currency				
Foreign Currency				
Net Bid Price				100.00

Note:

1. Change in scope would require agreement between parties on currency.
2. Regarding damages by the Authority, financing charges for a payment delays will be in corresponding currency amounts.
3. Delay damages will be recovered in currencies in proportion which in which contract price is payable.