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O. EXECUTIVE SUMMARY

0.1 PROJECT BACKGROUND

The Rajasthan State Government has decided to develop State Highways (SH), Major District Roads (MDR), Ordinary District Roads (ODR) & Village Roads of Alwar district through Public Works Department (PWD) with help of financial assistance from National Capital Region Planning Board (NCRPB), New Delhi.

0.1.1 ABOUT NCR

The NCR region originally had a total area of over 33500 sqkm spanning over 16 districts in three states (nine districts of Haryana, six districts of Uttar Pradesh and one district of Rajasthan) and National Capital Territory of Delhi. The NCR Planning Board (NCRPB), on 1st July 2013, agreed to include Bhiwani and Mahendergarh in Haryana and Bharatpur in Rajasthan in NCR. Taken together, the three districts are eight times the size of Delhi. This brings the number of districts in the NCR to 19, with the total area increasing by 34% to 45,887 sqkm.

Rajasthan Sub-region comprises of Alwar and Bharatpur districts with an area of 13,446 sqkm (Alwar 8,380 and Bharatpur 5,066 sqkm) which is 29.30% of total area of NCR region. The Sub Regional Plan proposed development of Alwar and Bhiwadi as Regional Centers. Five other towns of the sub-region were proposed as Sub-Regional Centers. Ten villages were proposed as Service Centers. Rest of the villages numbering 20 were proposed as Basic Villages. In this hierarchy of settlements the commensurate level of economic activities, industrial development, facilities and services were proposed. The total area of RSR is 8380 sq.km, which is 24.5% of total NCR area and 2.5% of the area of the State of Rajasthan Government of India and Government of Rajasthan have taken various steps to improvement infrastructures facilities in Rajasthan Sub Region (RSR) of NCR.

0.1.2 GROWTH POTENTIAL OF ALWAR

Till 2011 population growth of Alwar has been steadily ranging between 22 and 30 percent since 1971. However, during the last decade, the population growth declined from 30.3% in 1991-2001 to 22.7% in 2001-11. In Bharatpur

the population growth in the last decade also reduced to 21.29% as compared to 27.22% in 1991-2001.

At an average, the population growth of the sub region in the last decade reduced to 22.12% in 2001-2011 as compared to 29.02% in 1991-2001 (Table 4-6). The growth of urban population however depicts a different trend in the sub region. During the period from 1971 to 1991 growth rate of urban population increased to 49.52% in 1981-1991. There was a drastic slip in growth rate of urban population during 1991-2001 registering at 31.64% but it picked up at 36.20% during 2001-11. In both the districts of the sub region there has been a considerable increase in the absolute urban population in last three decades. There has been a two fold increase in urban population of Alwar in last three decades. There are total 26 towns in this sub region of the state. There are 16 towns in Alwar, of which 7 are statutory towns and out of 10 towns in Bharatpur, 9 are statutory towns. In all, there are 16 statutory and 10 census towns in this sub region. In the last decade new towns having status of Class V have emerged in the sub region and a gradual population increase has been witnessed in other towns. 8 new census towns have emerged in the sub region (all in Alwar except one).

It is to be noted that by 2011, there are three cities with population of more than 1 lakh; these are Alwar (3.22 lakh); Bharatpur (2.52 lakh) and Bhiwadi (1.04 lakh).

Emergence of Bhiwadi as a major growth node: Rapid population growth of Bhiwadi is a matter of concern. It was 33,000 in 2001 which is 1.04 lakh in 2011. The decadal growth rate is 200% in the last decade, which is something extraordinary. The unprecedented growth can be associated with the growth of industrial units of RIICO in the town and also to DMIC node (Khushkhera-Bhiwadi-Neemrana Investment Region). Bhiwadi in future is thus going to be a major urban centre. Apart from Bhiwadi, towns like Neemrana, Shahjahanpur and Diwakari have emerged as new towns (class IV and V) in the last decade.

Emergence of Shahjahanpur-Neemrana-Behror node (SNB): In the NCRPB Regional Plan 2021, Shahjahanpur-Neemrana-Behror, urban complex known as SNB region has been selected as the futuristic growth node while Khushkhera-Bhiwadi-Neemrana as investment region of DMIC. A draft master plan 2041 has already been notified for the region. SNB region of NCR would

be a major growth node attracting global investment and would present tremendous development potential in all sectors.

Delhi - Jaipur NH- 8 has a huge potential for capital investments due to its strategic location and linkages in and around NCR.

Many industrial units had come up and were established by RIICO in the region. However the region lacked basic physical and social infrastructural facilities. Owing to these basic requirements and massive growth and investment potentials, the NCRPB Regional Plan 2021 in year 2002, suggested the development of SNB as an urban complex. A Master plan for horizon year 2031 was finalized for the SNB urban complex.

As a part of the DMIC node at Khushkhera-Bhiwadi-Neemrana Investment Region (KBNIR), proposals for new township were also under process in the master plan with integration of 42 villages. Hence to integrate the proposals of the KBNIR node of DMIC, the earlier master plan of SNB was set aside and a new master plan for horizon year 2041 was proposed in 2012 which integrates 132 revenue villages and is in accordance with the proposals of DMIC.

The road transport of India carries 70% of freight and 85% passenger of total traffic annually. Numbers of vehicles have been growing at an average rate of 10.9 % per annum over the last five years, making national highways congested. Hence, it is necessary to enhance a good road network facility which will provide more economical, safe and environment friendly movement of passenger and goods vehicles to access jobs, health services, and education centers and transport the goods. Good roads would improve socio-economic, industrial, and agriculture activities and help in economical growth of nation.

Considering the above facts the PWD has formulated the various road packages and appointed the various consultant for preparation of Detailed Project Reports for various roads. The present Report is covering Package-1 road, Padisal-Jagta Basai-Ratta Khurd-Balan Basai-Shyamka-Ismailpur-Ganj-Kishangarhbas Road Km 0/000 to 24/975 of Alwar District.

Delhi with National Capital Region (NCR)



Figure 0-1: Map of NCR Region

0.2 PROJECT LOCATION

The project road corridor starts (Km 0/0) near Padisal and ends (Km 24/975) near Kishangarh Bas village in Alwar district. The total length of the project road is 24 Km. The project corridor (km 0/0 to 24/975) traverses through Basai Jagta, Rata Khurd, Ranoli, Tanholi and Kishangarh Bas villages. The Project Road location map is given in following figure.

0.3 NEED OF PROJECT IMPROVEMENT

The Proposed project road may serve an important link and connects SH-13 to MDR-61, which further provide connectivity to NH-8. The project road also connects Harsoli, Ramnagar, Meeraka, Basai Kalan, Kishangarh Bas, Mothuka, Barhera, Dhamooka, Baghora, Thana Ghoda, Balrampur, Patan Bhan, Pata, Roopbas and Mubarikpur village. Presently, due to the deficient vertical and horizontal alignment mostly only local traffic is using the Project road. Once the proposed corridor may improved as per Major District Road Standard the regional traffic may start to follow this link. Hence, the improvement is much needed. Once this link will improve the traffic movement may become easy.

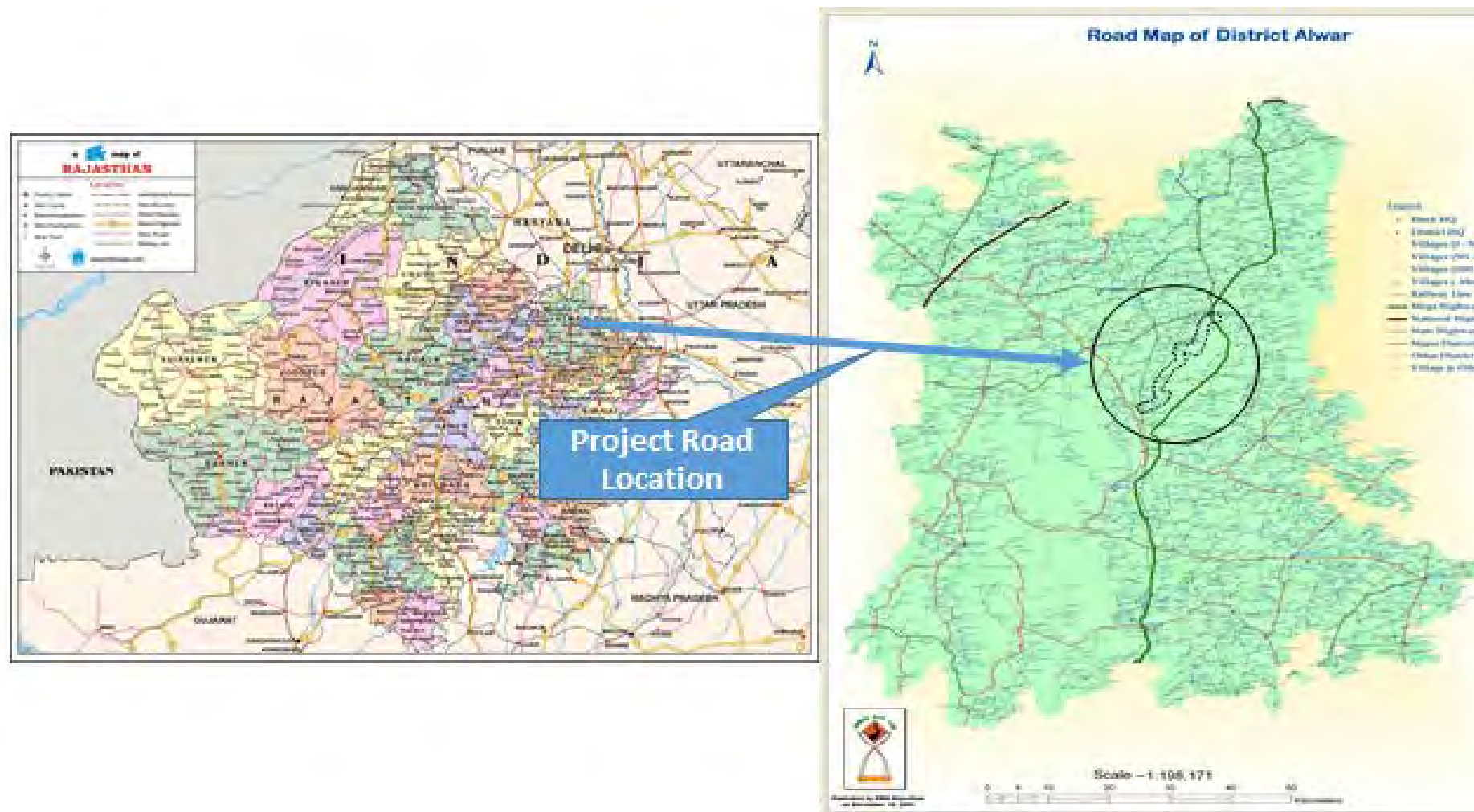


Figure 0-2: Project Road Location Map

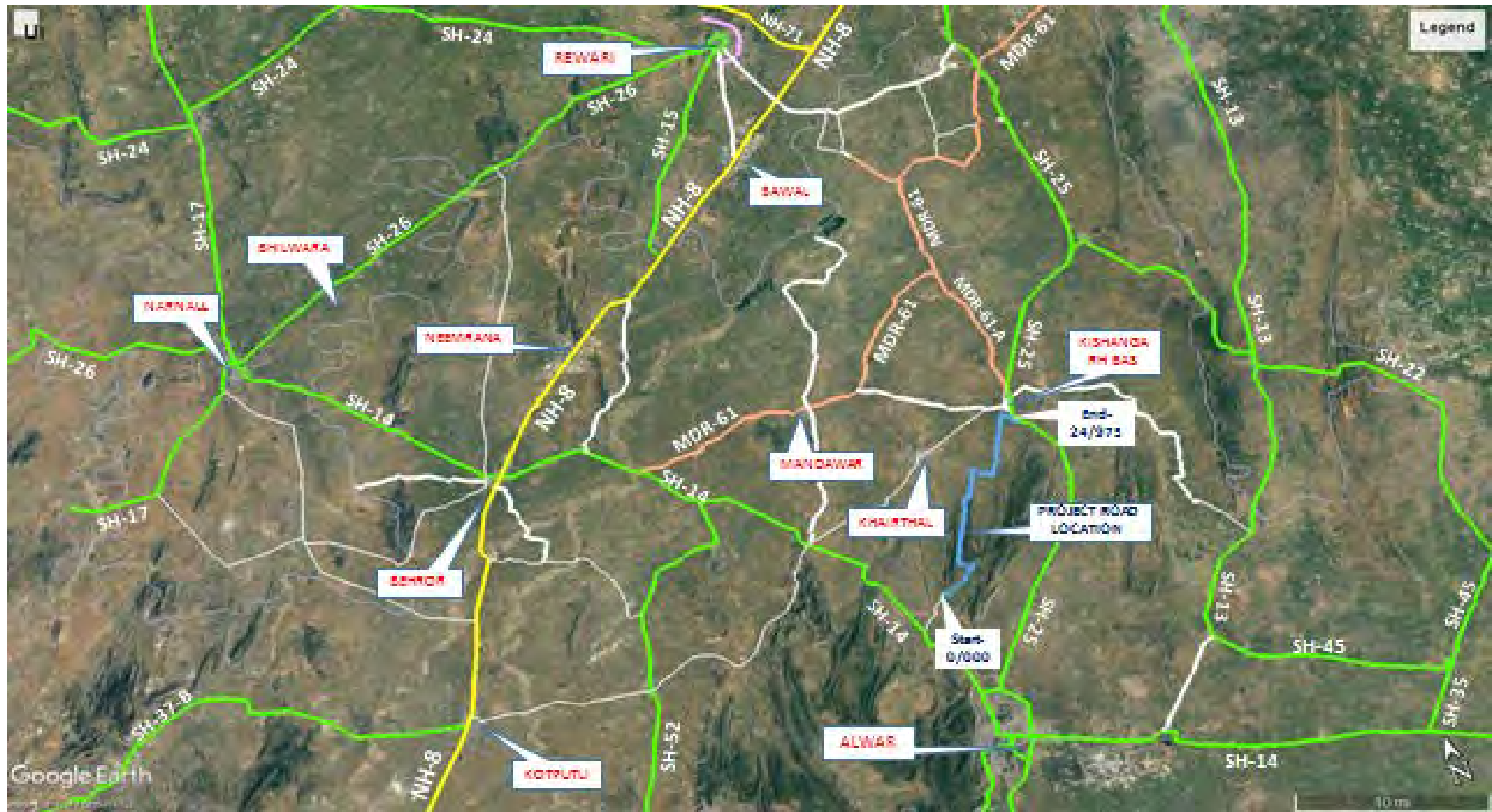


Figure 0-3: Regional Road network near by Project Road



Figure 0-4: Settlement along the Project Road

0.4 EXISTING FEATURES OF PROJECT ROAD

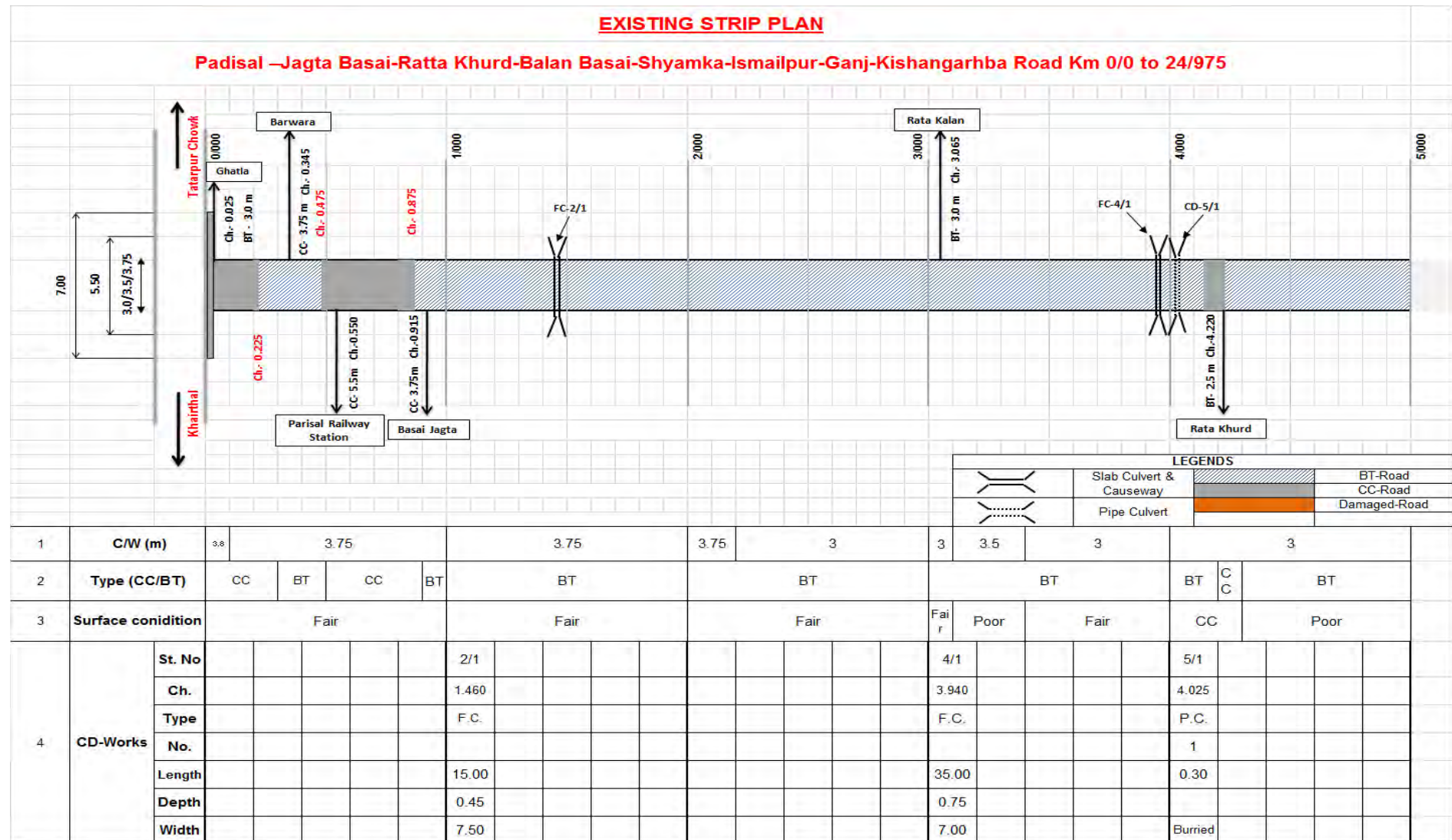
The Existing road has Single-Lane Carriageway in entire length of 9.48 Km. The existing road is deficient horizontal and vertical alignment, degraded earthen or no shoulder in most stretches, inadequate and damaged cross drainage structures and absence of side drains, safety installations, protection works and road furniture. The schematic Diagram of the existing project road features are given in following Figure. A salient feature of existing Project has been summarized in following Table.

Table 0-1: Salient Features of Existing Road

Particulars	Details
Terrain	Plain & rolling
Land Use	Landuse is predominantly unirrigated Agricultural land and forest Area Agricultural (14.91) km, Forest (5.97) km and Built up (4.1 km)
Built up Areas	Basai Jagta, Rata Khurd, Ranoli, Tanholi and Kishangarh Bas
ROW	10-15 m available as per revenue records.
Carriageway Configuration	24.975 km single lane 0.0 km Two-lane
Embankment height	0.10 to 1.80 m
Intersections/Junctions	3-Arms (23) & 4-Arms (1)
Pavement Condition	Mostly poor, some stretches are damaged. Crust: 30-100 mm BT & 160-240 mm Sub Base/Grade
Bridge1/Culverts	Major Bridge = 0 Minor Bridge = 0 Culvert = 4 Pipe, 2 Slab, Causeway=13,
ROB/RUB	NA
Geometry	Horizontal and vertical alignment of project corridor has lot of deficiencies
Side Drains	Exist in some part of Kishangarh Bas, Ismailpur, Basai Jagta village but in damaged condition
Road Facility/ Safety Feature	Does not exist in entire project road.
Traffic (ADT) in PCUs in Homogenous sections	1748

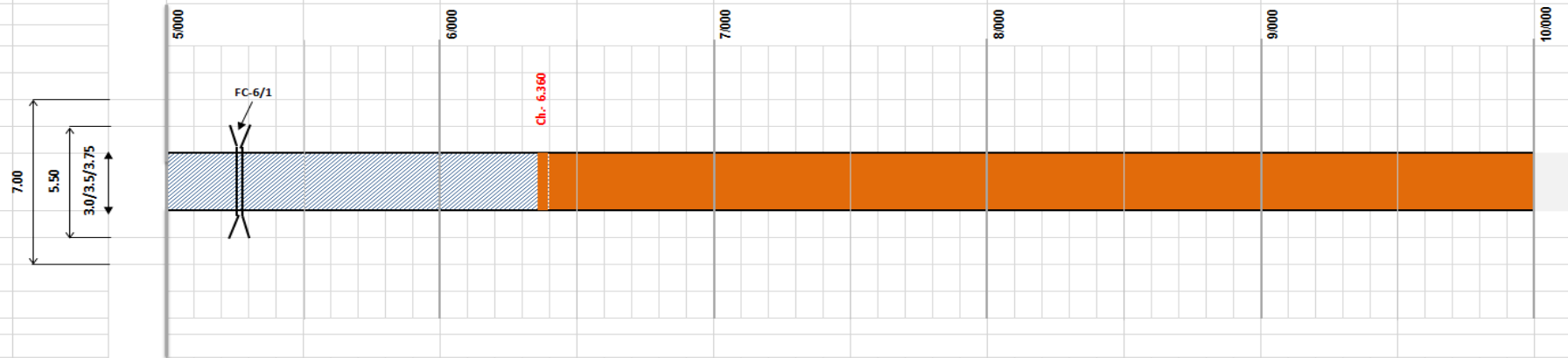
Source: Field Survey Done by Consultants, 2017

¹ Bridge with total length up to 60 m is termed as minor bridge and greater than 60 m is called major bridge.



EXISTING STRIP PLAN

Padisal –Jagta Basai-Ratta Khurd-Balan Basai-Shyamka-Ismailpur-Ganj-Kishangarhba Road Km 0/0 to 24/975

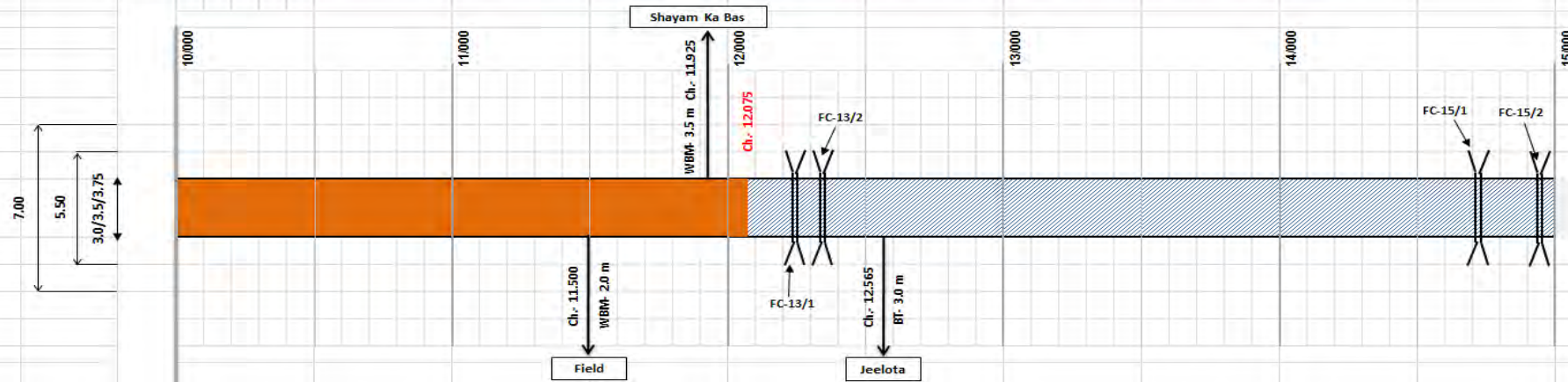


LEGENDS			
	Slab Culvert & Causeway		BT-Road
	Pipe Culvert		CC-Road
			Damaged-Road

1	C/W (m)	3	3	3	3.75	3.75	3.75
2	Type (CC/BT)	BT	BT	Damaged	Damaged	Damaged	Damaged
3	Surface condition	Poor	Poor	Poor	Poor	Poor	Poor
4	CD-Works	St. No	6/1				
		Ch.	5.265				
		Type	F.C.				
		No.					
		Length	50.00				
		Depth	0.60				
		Width	6.50				

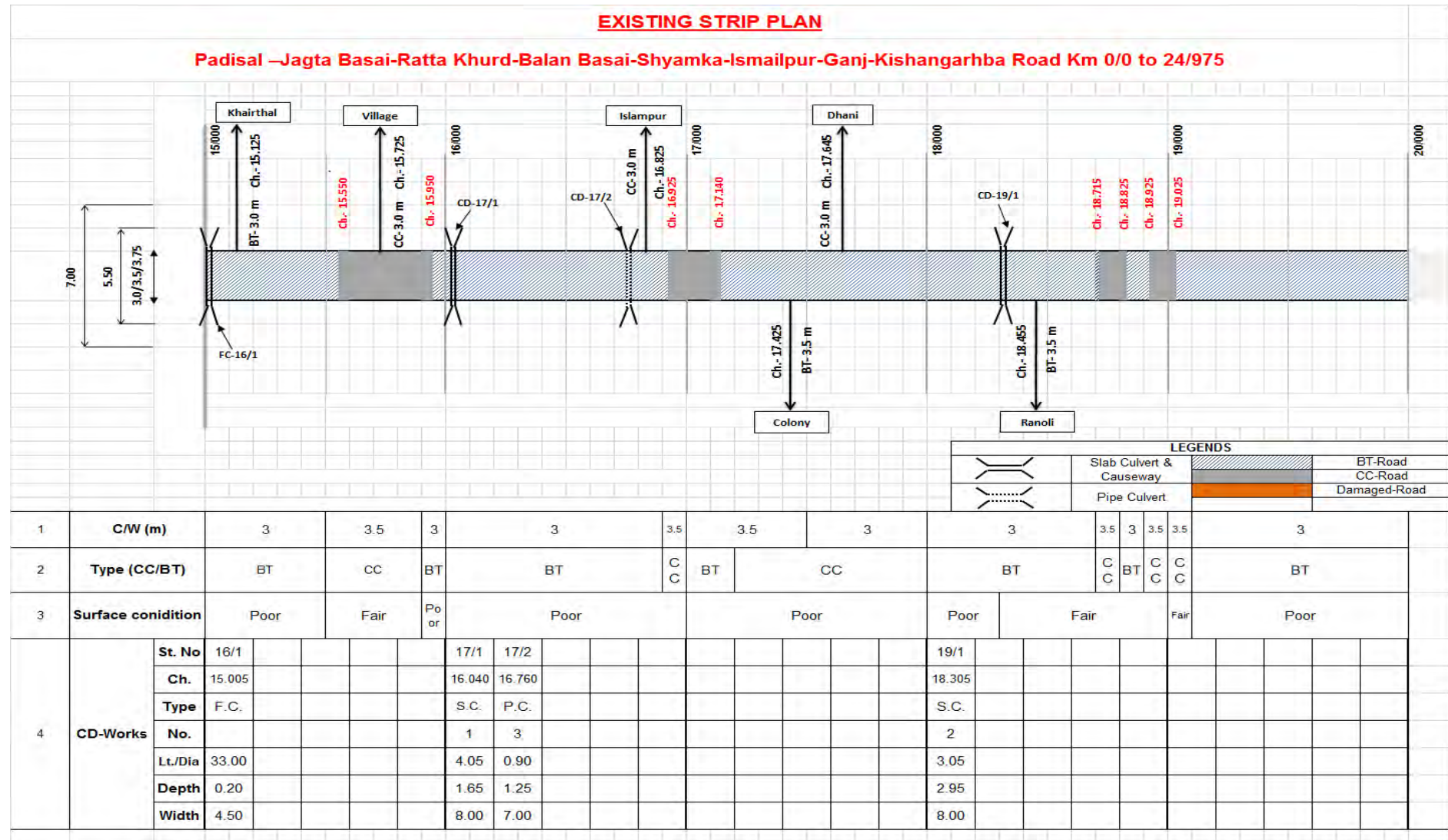
EXISTING STRIP PLAN

Padisal –Jagta Basai-Ratta Khurd-Balan Basai-Shyamka-Ismailpur-Ganj-Kishangarhba Road Km 0/0 to 24/975



LEGENDS			
	Slab Culvert & Causeway		BT-Road
	Pipe Culvert		CC-Road
			Damaged-Road

1	C/W (m)		3.75				3.75		3		3				3				3						
2	Type (CC/BT)		Damaged				Damaged				D A M.	BT				BT				BT					
3	Surface conidition		Poor				Poor				Poor				Poor				Poor						
4	CD-Works	St. No										13/1	13/2							15/1	15/2				
		Ch.										12.240	12.340							14.710	14.955				
		Type										F.C.	F.C.							F.C.	F.C.				
		No.																							
		Length										30.00	33.00							24.00	23.00				
		Depth										0.20	0.15							0.40	0.35				
		Width										7.50	5.50							6.00	5.00				



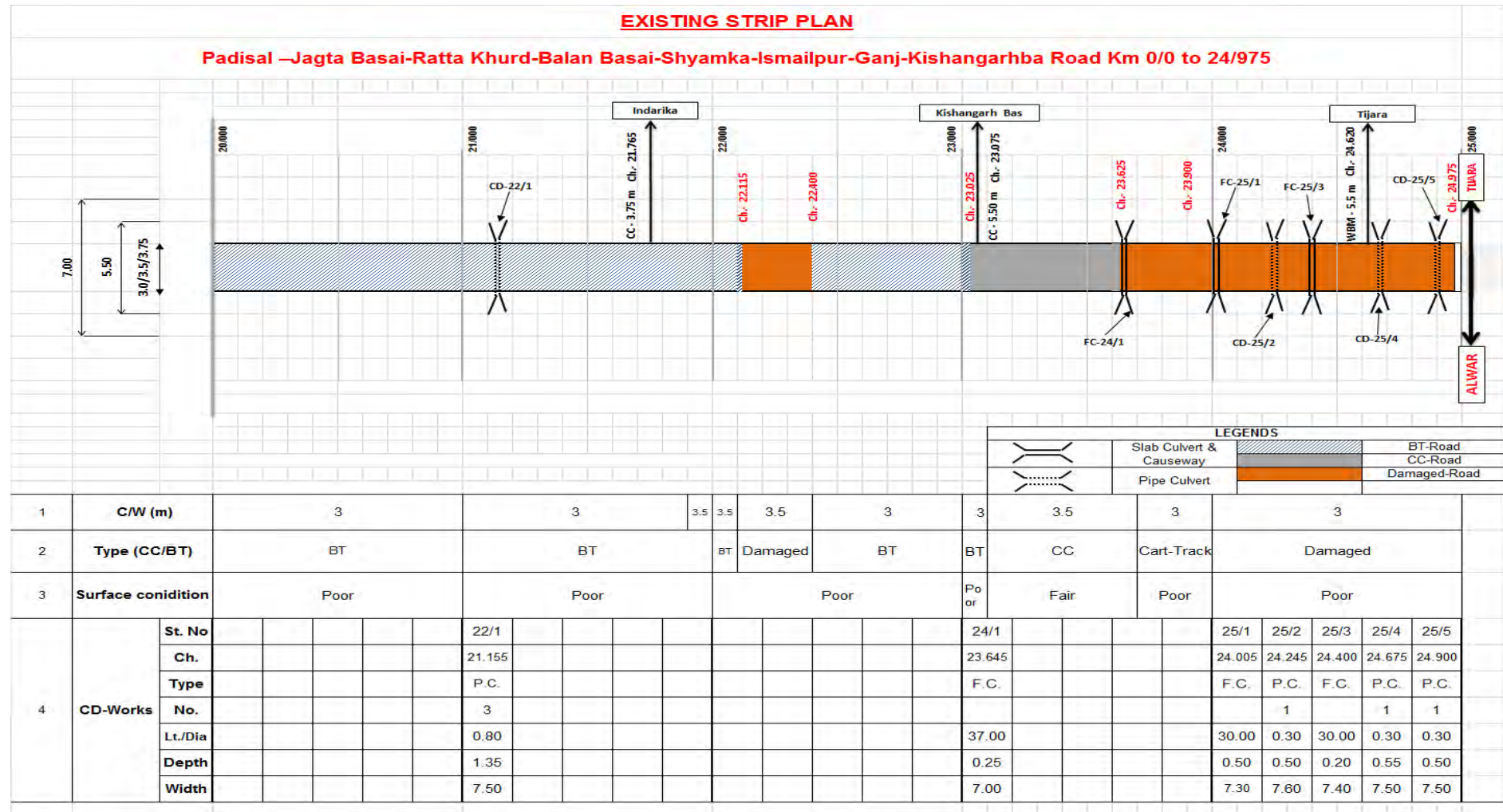


Figure 0-5: Existing Features of Project Road



Figure 0-6: Photo of Existing Features of Project Road

0.5 PROJECT OBJECTIVES

The Project aims to improve transport efficiency of the state road network, which will contribute to expansion of economic opportunities and poverty reduction. This will be realized by (i) improving the state highway network, (ii) facilitating safe and appropriate road usage, (iii) increasing efficiency of transport services and (iv) Enhancing GoR capacity for road asset development and management. Project immediate outcome will be improved accessibility to social services and markets, increased fuel efficiency, reduced travel time, accidents, vehicle emissions and better employment opportunities outside agriculture, both through improved access to economic centers and increased industrial activities in the project area.

To achieve the above objectives, candidate road will be improved Single to 2-lane with granular shoulder largely in consistent to Indian Road Congress (IRC) guidelines. Widening and improvement components will include (i) improvement in pavement conditions and road geometry (ii) reconstruction/ widening and provision of additional cross drainage (CD) structures, (iii) provision of lined drains in built-up sections, junction improvement, protection works, bus bays/truck lay byes and installation of safety measures etc.

0.6 PROPOSED DESIGN PARAMETERS

The Project road improvement will broadly follow special codal provisions relevant to state highways prescribed by Indian Road Congress (IRC:SP:73-2015) and Ministry of Road Transport and Highways (MoRTH) Guidelines. In case of any compromise with these guidelines, has been specifically mentioned with reasons. All efforts have been made to maintain the consistency of design criteria for all sub-projects barring few exceptional cases due to limiting factors for the reason that of ground conditions. Design criteria adopted for the project is summarized in following Table.

Table 0-2: Proposed Design Parameters

S. No	Parameters	Detail
1	Geometric design standards	IRC codes, guidelines and special publications. IRC:73-2015 "Two-laning of highways through Public Private Partnership" Manual of specifications and standards published by Planning Commission and orders issued as per GoR
2	Design Speed	Ruling -100 Km/Hr, Minimum 80. It reduces

S. No	Parameters	Detail
	(Km/hr)	near settlements, intersections, bridge approaches, horizontal curves etc.
3	Roadway Elements	Carriageway: 7.0m Granular shoulder- 2x2.5m Carriageway: 5.5m Granular shoulder- 2x2.25m
4	Service Road Width	Not provided
5	Embankment Slope	In filling- 1V: 2 H In cutting- 1V:1H
6	Ditch Slopes (H:V)	1:1 (Fore slope or back slope)
7	Camber	Carriageway/Paved Shoulder- 2.5 %, Unpaved/Hard Shoulder-3.0.0%
8	Super-elevation	Maximum 7%
9	Min Radii for Horizontal Curves	360 m for 100 km/hr, 230 m for speed of 80 km/hr,
10	Gradient(rolling/mountainous)	Ruling: 3.3/6.0%, Limiting:5.0/7.0%, Exceptional 6.7/8.0%
11	Design Flood Frequency	Bridges: 50 years, with anticipated risk of rarer flood of next higher frequency i.e. 100 yr return period flood on the structure
12	Free board	0.6m to 1.5 m depending on discharge

0.7 ENGINEERING SURVEYS & INVESTIGATIONS

Following engineering surveys and investigations has been done.

- Engineering Surveys and Investigations:
 - Reconnaissance and Alignment
 - Topographic Surveys: Topographic surveys were carried out in the months of April 2017 with DGPS & Total Station.
 - Road and Pavement Investigation
 - Road Inventory Surveys
 - Pavement Investigation-Pavement Composition, Road and Pavement Condition Surveys, Pavement Roughness, Pavement Structural Strength
 - Sub grade Characteristics and Strength

- Investigations for Bridges and Structure:
 - Inventory and condition surveys for bridges, cross-drainage structures, other Structures, river Bank training/Protection works and drainage provisions;
 - Hydraulic and Hydrological Investigations
- Identification of sources of construction materials;
- Traffic Surveys , Analysis & Projections

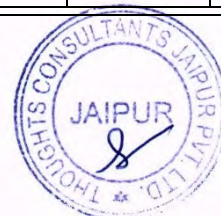
0.8 TRAFFIC SURVEYS & ANALYSIS

0.8.1 AVERAGE DAILY TRAFFIC

The traffic volume count survey was conducted in June, 2017 at two locations. A summary of the Average Daily Traffic (ADT) at two count stations for Seven days volume counts is presented in Table 0-3.

Table 0-3: Average Daily Traffic

Vehicle Code	Vehicle Type	Average Daily Traffic (ADT)			PCU		
		Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both	Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both
1	Two Wheeler	489	434	922	245	217	461
2	Three Wheeler - Passenger	2	0	2	2	0	2
3	Three Wheeler - Goods	0	0	0	0	0	0
4	Car Jeep Van Taxi	34	24	58	34	24	58
5	Mini Bus	2	0	2	3	0	3
6	Bus	0	3	3	0	9	9
7	LCV Type 1 (< 3Tonne)	21	18	39	32	27	59
8	LCV Type 2 (> 3Tonne & < 7.5 Tonne)	14	5	18	21	8	27
9	LCV Type 3 (> 7.5Tonne)	0	0	0	0	0	0
10	Truck 2-Axle	0	0	0	0	0	0
11	Truck 3-Axle	0	0	0	0	0	0
12	Truck 4-6-Axle	0	0	0	0	0	0
13	Truck =>7-Axle	0	0	0	0	0	0



Vehicle Code	Vehicle Type	Average Daily Traffic (ADT)			PCU		
		Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both	Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both
14	HCM/EME	0	0	0	0	0	0
15	Tractor without Trailer/Agriculture	2	0	2	3	0	3
16	Tractor with Trailer	13	3	16	59	14	72
17	Cycle	0	0	0	0	0	0
18	Cycle Ricksaw	0	0	0	0	0	0
19	Hand Cart	0	0	0	0	0	0
20	Animal Drawn Bullock Cart	0	0	0	0	0	0
21	Animal Drawn Horse/Camel	0	0	0	0	0	0
22	Car - Toll Exempted	0	0	0	0	0	0
23	Bus/Truck - Toll Exempted	0	0	0	0	0	0
Grand Total		577	487	1062	399	299	694

Vehicle Code	Vehicle Type	Average Daily Traffic (ADT)			PCU		
		Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both	Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both
1	Two Wheeler	690	652	1342	345	326	671
2	Three Wheeler - Passenger	7	6	13	7	6	13
3	Three Wheeler - Goods	0	0	0	0	0	0
4	Car Jeep Van Taxi	110	115	225	110	115	225
5	Mini Bus	0	0	0	0	0	0
6	Bus	2	3	5	6	9	15
7	LCV Type 1 (< 3Tonne)	17	26	43	26	39	65
8	LCV Type 2 (> 3Tonne & < 7.5 Tonne)	6	9	14	9	14	21
9	LCV Type 3 (> 7.5Tonne)	15	6	21	45	18	63
10	Truck 2-Axle	2	1	3	6	3	9
11	Truck 3-Axle	0	0	0	0	0	0
12	Truck 4-6-Axle	0	0	0	0	0	0

Vehicle Code	Vehicle Type	Average Daily Traffic (ADT)			PCU		
		Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both	Pdisal to Kishangarhbass	Kishangarhbass to Pdisal	Both
13	Truck =>7-Axle	0	0	0	0	0	0
14	HCM/EME	0	0	0	0	0	0
15	Tractor without Trailer/Agriculture	2	0	2	3	0	3
16	Tractor with Trailer	19	9	28	86	41	126
17	Cycle	27	14	41	14	7	21
18	Cycle Ricksaw	0	0	1	0	0	2
19	Hand Cart	0	0	0	0	0	0
20	Animal Drawn Bullock Cart	0	0	0	0	0	0
21	Animal Drawn Horse/Camel	7	3	10	56	24	80
22	Car - Toll Exempted	0	0	0	0	0	0
23	Bus/Truck - Toll Exempted	0	0	0	0	0	0
Grand Total		904	844	1748	713	602	1314

MT-Motorized Transport and NMT-Non Motorized Transport

The Seasonal variation trends were observed based on sale of automobile fuel i.e. Petrol and Diesel. Average seasonal factors have been worked out to arrive at Annual Average Daily Traffic. To get an idea of traffic variation at Alwar, data of diesel and petrol sales at fuel pumps was collected. The seasonal correction factor of every month is shown Table 0-4.

Table 0-4: Seasonal Correction Factors (SCF) Based on Monthly Traffic

Month	Diesel Vehicles	Petrol Vehicles
April-15	1.55	0.97
May-15	1.02	1.00
June-15	1.00	1.00
July-15	0.97	1.19
August-15	0.71	1.31
September-15	0.64	1.63
October-15	0.78	1.00
November-15	0.98	1.19
December-15	1.04	1.16
January-16	1.16	1.31
February-16	1.00	0.91

March-16	1.43	1.25
SVF	1.02	1.16

Since traffic volume count surveys were carried out in the month of June, 2017, the seasonal factors (based on the above data) has been worked out and ADT figures have been converted in AADT.

0.8.2 ANNUAL AVERAGE DAILY TRAFFIC (AADT)

Annual Average Daily Traffic has been worked out by applying the above obtained seasonal variation factors to the Average Daily Traffic. The AADT values obtained at two traffic count stations are given in the following table.

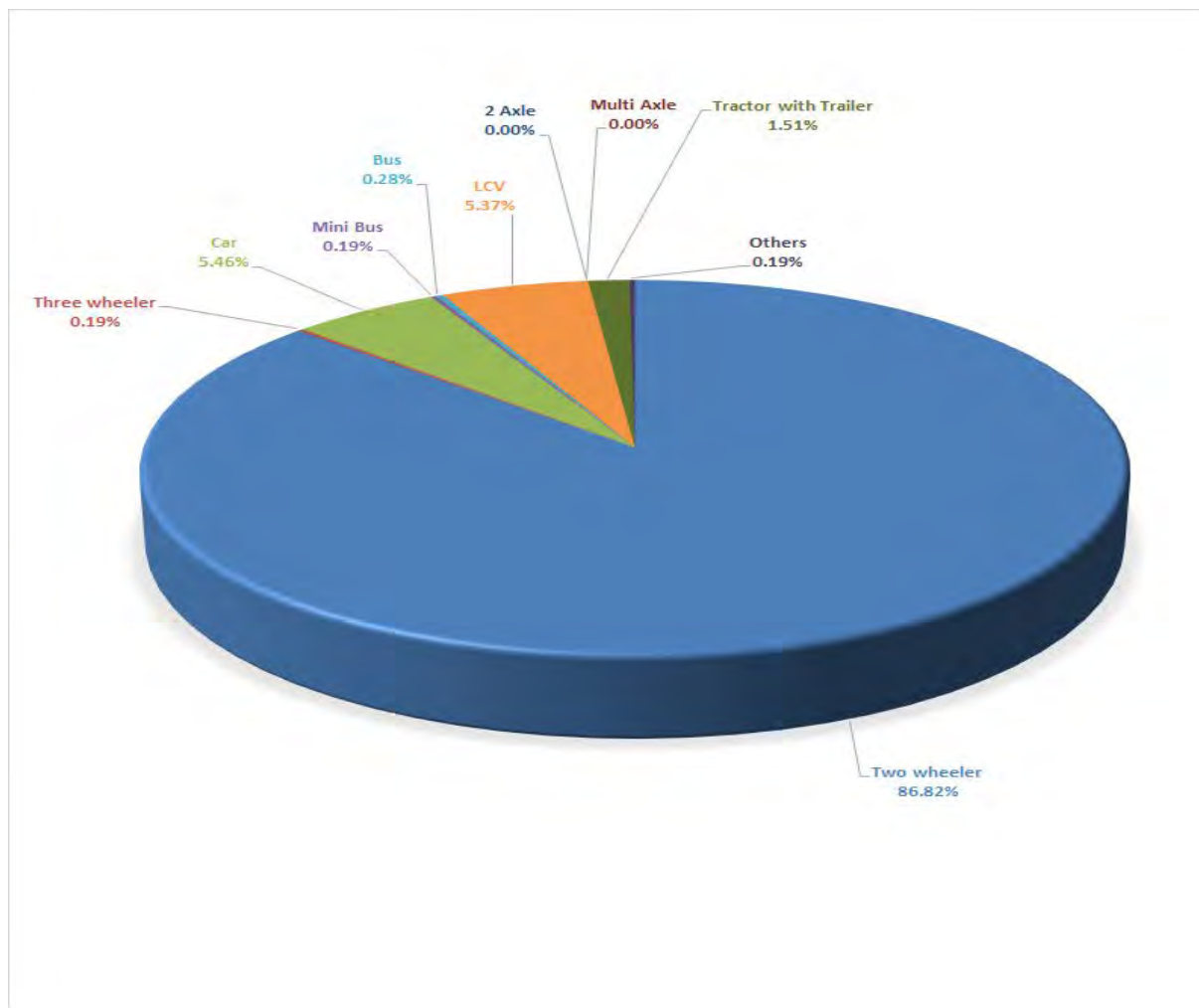
Table 0-5: Annual Average Daily Traffic

Vehicle Code	Vehicle Type	Average Annual Daily Traffic (AADT)			PCU		
		Padisal to Kishangarhbas	Kishangarhbas to Padisal	Both	Padisal to Kishangarhbas	Kishangarhbas to Padisal	Both
1	Two Wheeler	567	503	1070	284	252	536
2	Three Wheeler - Passenger	2	0	2	2	0	2
3	Three Wheeler - Goods	0	0	0	0	0	0
4	Car Jeep Van Taxi	39	28	67	39	28	67
5	Mini Bus	2	0	2	3	0	3
6	Bus	0	3	3	0	9	9
7	LCV Type 1 (< 3Tonne)	21	19	40	32	29	61
8	LCV Type 2 (> 3Tonne & < 7.5 Tonne)	14	5	19	21	8	29
9	LCV Type 3 (> 7.5Tonne)	0	0	0	0	0	0
10	Truck 2-Axle	0	0	0	0	0	0
11	Truck 3-Axle	0	0	0	0	0	0
12	Truck 4-6-Axle	0	0	0	0	0	0
13	Truck =>7-Axle	0	0	0	0	0	0
14	HCM/EME	0	0	0	0	0	0
15	Tractor without Trailer/Agriculture	2	0	2	3	0	3
16	Tractor with Trailer	14	3	17	63	14	77
17	Cycle	0	0	0	0	0	0
18	Cycle Ricksaw	0	0	0	0	0	0

Vehicle Code	Vehicle Type	Average Annual Daily Traffic (AADT)			PCU		
		Pdisal to Kishangarhb ass	Kishangarh bass to Pdisal	Both	Pdisal to Kishangarhb ass	Kishangarh bass to Pdisal	Both
19	Hand Cart	0	0	0	0	0	0
20	Animal Drawn Bullock Cart	0	0	0	0	0	0
21	Animal Drawn Horse/Camel	0	0	0	0	0	0
22	Car - Toll Exempted	0	0	0	0	0	0
23	Bus/Truck - Toll Exempted	0	0	0	0	0	0
	Grand Total	661	561	1222	447	340	787

Vehicle Code	Vehicle Type	Average Annual Daily Traffic (AADT)			PCU		
		Pdisal to Kishangarhb ass	Kishangarh bass to Pdisal	Both	Pdisal to Kishangarhb ass	Kishangarh bass to Pdisal	Both
1	Two Wheeler	801	756	1557	401	378	779
2	Three Wheeler - Passenger	7	6	13	7	6	13
3	Three Wheeler - Goods	0	0	0	0	0	0
4	Car Jeep Van Taxi	128	133	261	128	133	261
5	Mini Bus	0	0	0	0	0	0
6	Bus	2	3	5	6	9	15
7	LCV Type 1 (< 3Tonne)	18	26	44	27	39	66
8	LCV Type 2 (> 3Tonne & < 7.5 Tonne)	6	9	15	9	14	23
9	LCV Type 3 (> 7.5Tonne)	16	6	22	48	18	66
10	Truck 2-Axle	2	1	3	6	3	9
11	Truck 3-Axle	0	0	0	0	0	0
12	Truck 4-6-Axle	0	0	0	0	0	0
13	Truck =>7-Axle	0	0	0	0	0	0
14	HCM/EME	0	0	0	0	0	0
15	Tractor without Trailer/Agriculture	2	0	2	3	0	3
16	Tractor with Trailer	19	10	29	86	45	131
17	Cycle	27	14	41	14	7	21

Vehicle Code	Vehicle Type	Average Annual Daily Traffic (AADT)			PCU		
		Pdisal to Kishangarhbas	Kishangarhbas to Pdisal	Both	Pdisal to Kishangarhbas	Kishangarhbas to Pdisal	Both
18	Cycle Ricksaw	0	0	0	0	0	0
19	Hand Cart	0	0	0	0	0	0
20	Animal Drawn Bullock Cart	0	0	0	0	0	0
21	Animal Drawn Horse/Camel	7	3	10	56	24	80
22	Car - Toll Exempted	0	0	0	0	0	0
23	Bus/Truck - Toll Exempted	0	0	0	0	0	0
	Grand Total	1035	967	2002	791	676	1467



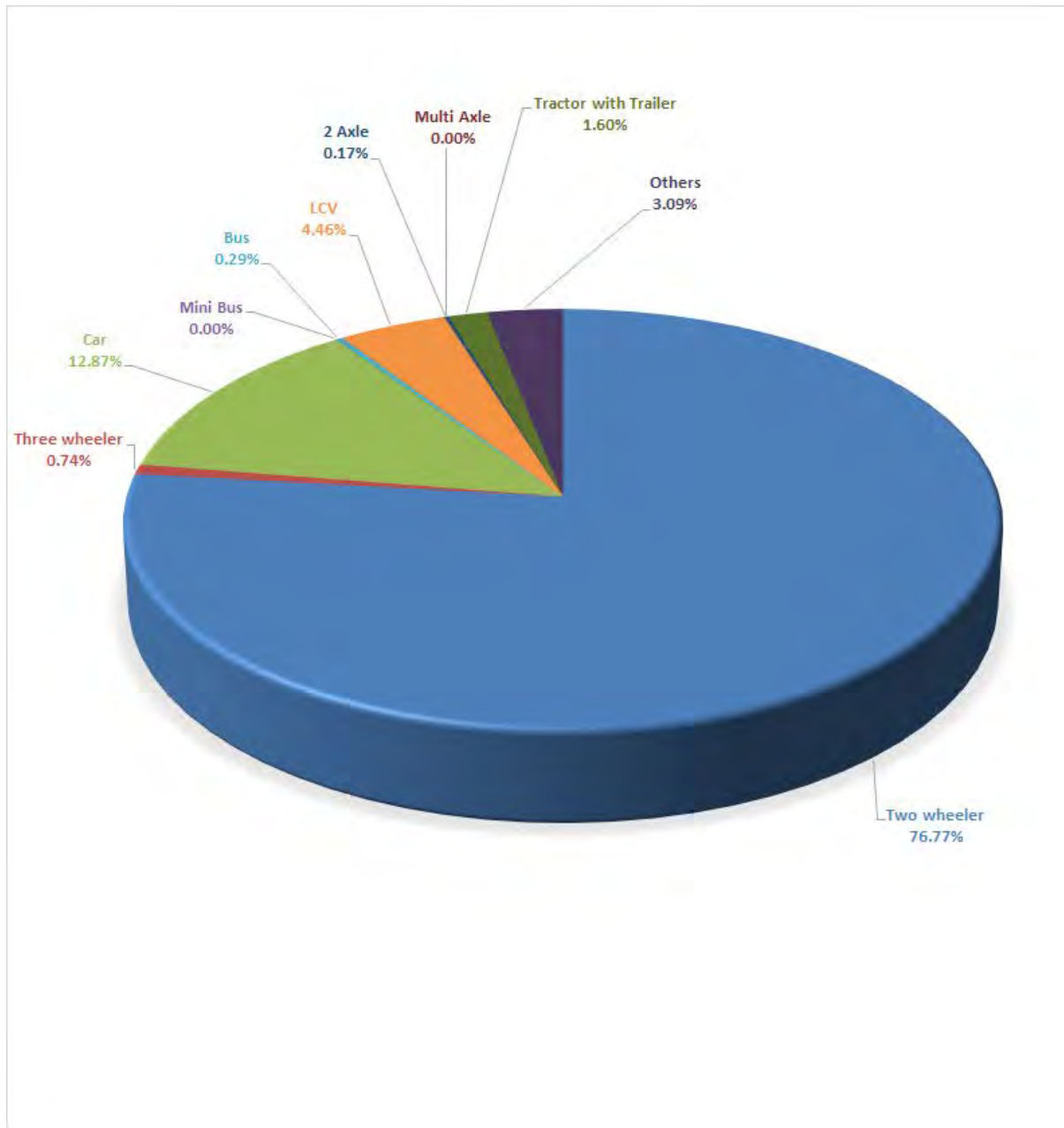


Figure 0-7: Traffic Composition Project Road

0.8.3 ANALYSIS OF TURNING MOVEMENT SURVEY

Turning Movement Survey was conducted for 12 hours at 1 intersections on the project corridor. Table 0-9below gives location wise peak hour traffic during morning and evening.

Table 0-6: Summary of Peak Hour Flow at Various Intersections

Sr. No	Location	Location Details	Type	12 Hour TMC	Peak Hour TMC
				Total No. of Vehicle	Total No. of Vehicle
1	Km 0/00	Near Padisal Railway Station	3 - Leg Junction	1113	134

As per IRC: 62-1976, "Guidelines for Control of Access on Highways", grade separations should be provided across divided rural highways at intersections, if the ADT (Fast vehicles only) on the cross road within the next five years exceeds 5,000.

0.8.4 ANALYSIS OF AXLE LOAD SURVEY

The data collected from the Axle Load Survey has been compiled and analyzed through "Fourth power" pavement damage law to arrive at the vehicles damage factor (VDF). The Vehicle Damage Factor is a multiplier to convert the number of commercial vehicles of different axle loads and axle configuration to the number of standard axle load repetitions. The recorded sample size is analyzed to obtain Vehicle Damage Factor (VDF) and Load spectrum has been presented in following Table.

Table 0-7: VDF Values Obtained from Field Survey

Vehicle Type	VDF			Traffic			Standard Axle
	GHAT to RAJPUR BADA	RAJPUR BADA to GHAT	Both Direction	GHAT to RAJPUR BADA	RAJPUR BADA to GHAT	Both Direction	
BUS	0.58	0.84	0.71	15	14	29	20.53
LGV	0.25	0.76	0.51	31	33	64	32.60

Vehicle Type	VDF			Traffic			Standard Axle
	GHAT to RAJPUR BADA	RAJPUR BADA to GHAT	Both Direction	GHAT to RAJPUR BADA	RAJPUR BADA to GHAT	Both Direction	
2 Axle	7.40	6.04	6.72	16	19	35	235.26
3 Axle	5.81	3.45	4.63	7	7	14	64.80
M Axle	7.50	13.36	10.43	1	1	2	20.86
					Total	144	374.04371
					Weightage VDF		2.60

Table 0-8: Load Spectrum Value of Project Road

Single Axle Loads				Tandem Axle Loads				Tridem Axle Loads			
From, kN	To, kN	Class	Percent age of Axle Loads	From, kN	To, kN	Class	Percent age of Axle Loads	From, kN	To, kN	Class	Percent age of Axle Loads
185	195	185kN-195kN	0.0%	380	400	380kN-400kN	0.0%	530	560	530kN-560kN	0.0%
175	185	175kN-185kN	0.0%	360	380	360kN-380kN	0.0%	500	530	500kN-530kN	0.0%
165	175	165kN-175kN	0.0%	340	360	340kN-360kN	0.0%	470	500	470kN-500kN	0.0%
155	165	155kN-165kN	7.4%	320	340	320kN-340kN	0.0%	440	470	440kN-470kN	0.0%
145	155	145kN-155kN	1.9%	300	320	300kN-320kN	0.0%	410	440	410kN-440kN	0.0%

Single Axle Loads				Tandem Axle Loads				Tridem Axle Loads			
From, kN	To, kN	Class	Percent age of Axle Loads	From, kN	To, kN	Class	Percent age of Axle Loads	From, kN	To, kN	Class	Percent age of Axle Loads
135	145	135kN-145kN	1.9%	280	300	280kN-300kN	0.0%	380	410	380kN-410kN	100.0%
125	135	125kN-135kN	1.9%	260	280	260kN-280kN	16.7%	350	380	350kN-380kN	0.0%
115	125	115kN-125kN	1.9%	240	260	240kN-260kN	16.7%	320	350	320kN-350kN	0.0%
105	115	105kN-115kN	0.0%	220	240	220kN-240kN	0.0%	290	320	290kN-320kN	0.0%
95	105	95kN-105kN	7.4%	200	220	200kN-220kN	33.3%	260	290	260kN-290kN	0.0%
85	95	85kN-95kN	7.4%	180	200	180kN-200kN	33.3%	230	260	230kN-260kN	0.0%
0	85	0kN-85kN	70.4%	0	180	0kN-180kN	0.0%	0	230	0kN-230kN	0.0%

0.9 TRAFFIC PROJECTIONS

0.9.1 ADOPTED MODE-WISE GROWTH RATES

The Consultant has made an assessment of the traffic demand for the Project Highway for a period of 10 years, 15 years, 20 years, 25 years and 30 years respectively based on analysis of traffic counts, trend growth and growth in the influence area of the Project. An annual growth rate of 7.5% has been assumed vehicles for the traffic projections. The high traffic Growth Rate has

been considered due to the proposed future development of DMIC node, RIICO industrial Area Development and other proposed development of as per NCR Master Plan in Alwar District. Apart from this at this stage no induced and diverted traffic can be assessed. Considering all above factors the higher Traffic Growth Rate has been taken. .

0.9.2 PROJECTED TOTAL TRAFFIC VOLUME ON HOMOGENEOUS SECTIONS

The classified traffic volume count data has been projected from 2017-18 to the horizon year (2049-50) for all the homogenous sections. The growth was estimated on an unconstrained capacity scenario in order to assess the maximum extent of traffic flow in the corridor under consideration. The summaries of total projected traffic volume for each of the homogeneous section of the project corridor are given in following Table.

Table 0-9: Summary of Projected Total Traffic Volume

S. No.	Year	No. Vehicles	PCUs	Remarks
1	2017	2003	1467	Single –lane
2	2019	2331	1730	Single –lane
3	2024	3383	2569	Intermediate –lane
4	2029	4889	3762	Intermediate –lane
5	2034	7055	5485	Intermediate –lane
6	2039	10163	7957	Two-Lane
7	2044	14627	11511	Two-Lane
8	2049	21040	15177	Two-Lane

As per the Traffic analysis it emerged that present traffic on project road will not cross 15000 PCU's in 30 years Design period after construction. As per the IRC SP 73, 2015 Two-Lane Road may be sufficient to carry the traffic load.

0.10 FORMULATION OF IMPROVEMENT PROPOSALS

The improvement proposal is based on the findings from various engineering surveys and investigations carried out on the project road section and as discussed in Chapter 6: Engineering Survey and Investigation and Chapter 8: Traffic Survey and Analysis. 2-lane with 2.50m wide granular shoulder (both sides). All the proposals are in conformity with the provisions of IRC: SP: 73-

2015. Total formation width in general is 12 m. All efforts have been made to accommodate the improvement work within available ROW. No bypass or major realignment is proposed. The proposed cross-section is given in following figure.

0.10.1 PROPOSED WIDENING

A summary of the proposed Typical Cross Section along the Project Highway is given in following Table.

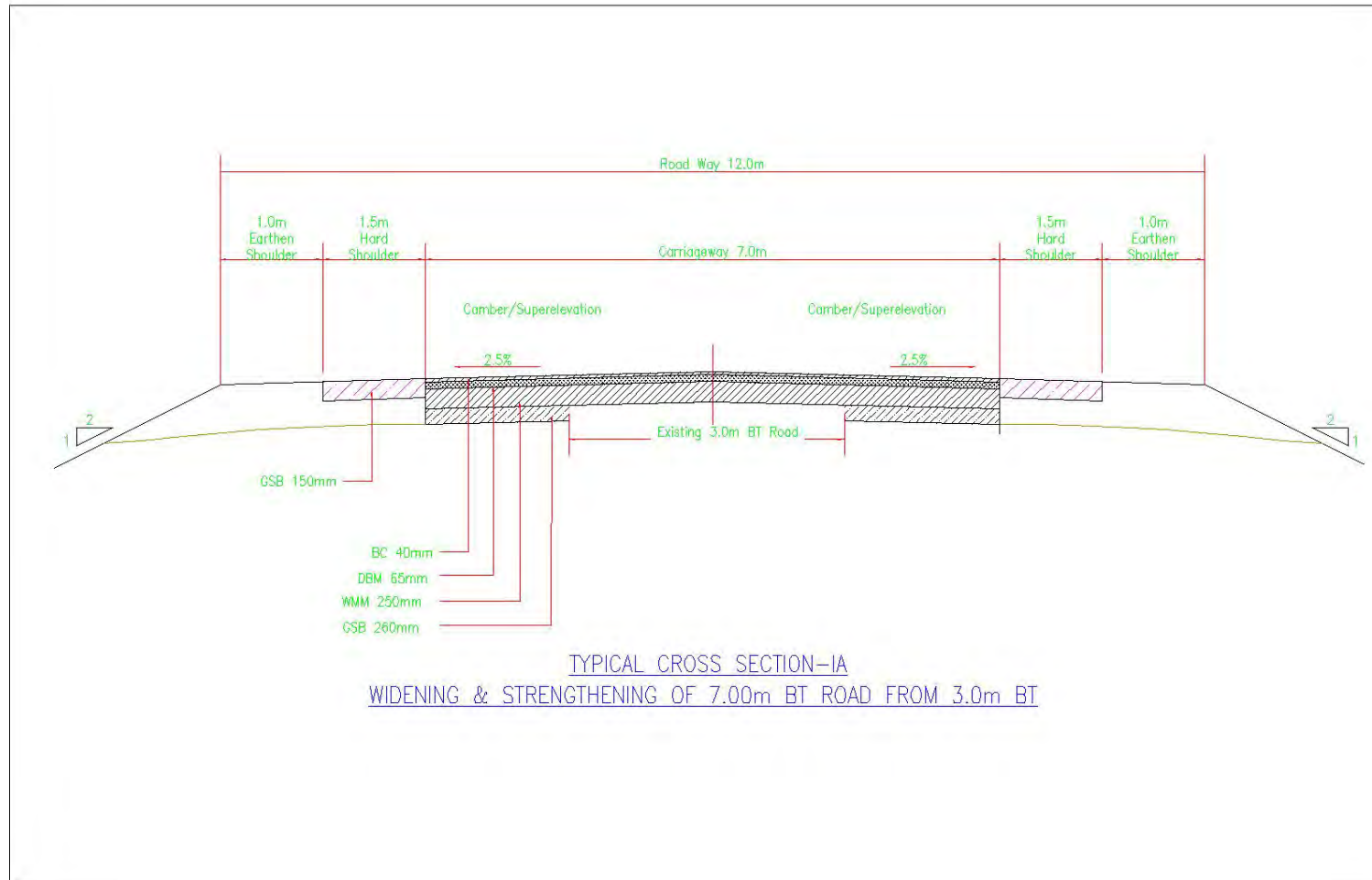
Table 0-10:: Summary of Proposed Cross Sections

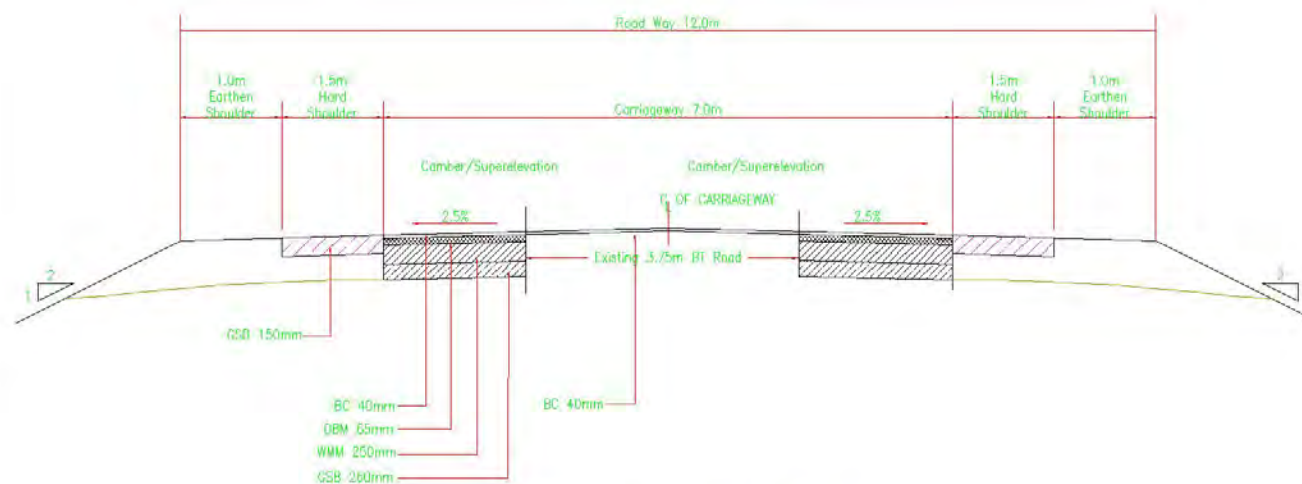
S. N.	Description	Type of proposed CS	Length (m)
1	Widening & Strengthening 7.0 BT (BC,DBM, WMM) from 3.0 m BT	TCS IA	4.825
2	Widening & Strengthening 7.0 BT (BC,) from 3.0 m BT	TCS IB	1.830
3	Reconstruction 7.0 BT (BC,DBM, WMM, GSB) from Damaged	TCS II	1.475
4	Reconstruction 7.0 m CC from 3.0 m CC	TCS III A	0.675
5	Reconstruction 7.0 m CC from 3.0 m BT	TCS III B	0.675
	Total		9.480

Table 0-11 :: Summary of Proposed Cross Sections

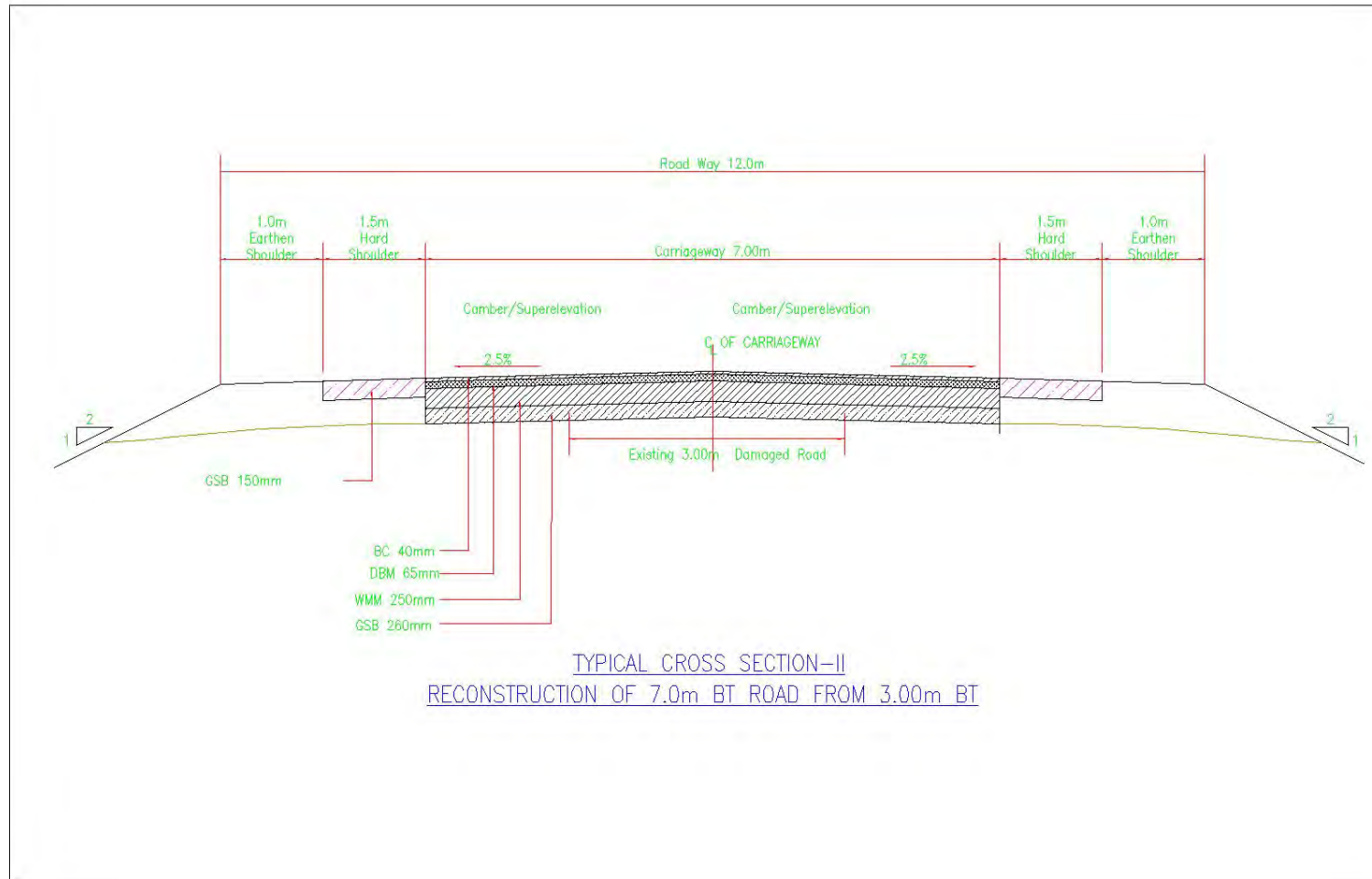
Sr.No.	Design Chainage (Km)		Design Length (Km.)	Type	Ext C/W (m)	Condition	Proposed Type	Proposed C/W (m)	Improvement	TCS type
	From	To								
1	0.00	4.83	4.825	BT	3	Poor	BT	7.00	Widening & Strengthening 7.0 BT (BC,DBM, WMM) from 3.0 m BT	TCS IA
2	4.83	5.35	0.525	BT	3	Poor	CC	7.00	Reconstruction 7.0 m CC from 3.0 m BT	TCS III B
3	5.35	5.50	0.150	BT	3.5	Poor	CC	7.00	Reconstruction 7.0 m CC from 3.0 m BT	TCS III B
4	5.50	6.35	0.850	Damaged	3.5	Poor	BT	7.00	Reconstruction 7.0 BT (BC,DBM, WMM, GSB) from Damaged	TCS II
5	6.35	6.53	0.175	CC	3	Poor	CC	7.00	Reconstruction 7.0 m CC from 3.0 m CC	TCS III A
6	6.53	7.15	0.625	BT	3.5	Poor	BT	7.00	Reconstruction 7.0 BT (BC,DBM, WMM, GSB) from Damaged	TCS II
7	7.15	7.65	0.500	CC	3.75	Poor	CC	7.00	Reconstruction 7.0 m CC from 3.0 m CC	TCS III A
8	7.65	9.48	1.830	BT	3.75	Fair	BT	7.00	Widening & Strengthening 7.0 BT (BC,) from 3.0 m BT	TCS IB

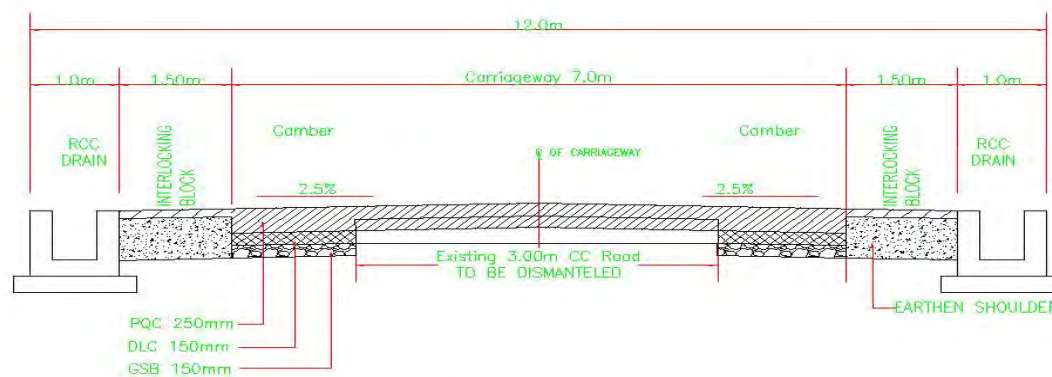




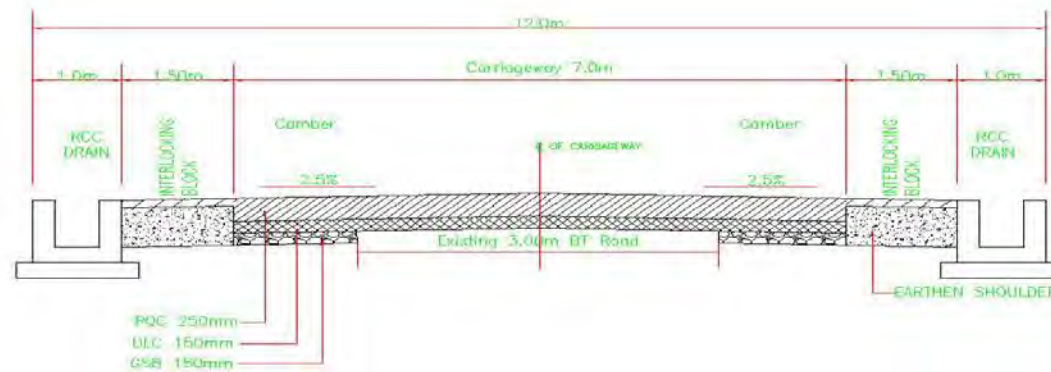


TYPICAL CROSS SECTION-IB
WIDENING TO 7.0m BT ROAD FROM 3.75m BT





TYPICAL CROSS SECTION-III A
RECONSTRUCTION OF 7.00m CC ROAD FROM 3.00 m CC ROAD



TYPICAL CROSS SECTION-III B
RECONSTRUCTION OF 7.00m CC ROAD FROM 3.00 m BT

Figure 0-8: Typica Cross section

0.10.2 CURVE IMPROVEMENT

The horizontal curves have been eased to the extent feasible considering the ground constraints. Horizontal geometry will be based on IRC: 38-1988 "Guidelines for Design of Horizontal Curves for Highways (First Revision)" and vertical geometry will be based on IRC: SP 23-1993 ".Generally, absolute minimum radius of 230 -250 m is to be provided for horizontal curves (80kmph). However, there are locations where speed reduction is inevitable owing to site constraints.

0.10.3 PROPOSED CROSS DRAINAGE STRUCTURES IMPROVEMENT PLAN

Only 1 minor bridges and 52 culverts are included in the project scope. Waterway and elevation of many structures have been designed considering 50 year return period with anticipated risk of rarer flood of next higher frequency i.e. 100 yr return period flood on the structure. Summary of structures is provided in following Table.

Table O-11: Details of Bridges and Culverts under Project Scope

Type of Cross Drainage Structure		
Major Bridge	Minor Bridge	Culvert
Nil	1	46-Pipe & 6-Slab (All are replaced by Box Culverts)

0.10.4 DRAINAGE IMPROVEMENT PLAN

Existing road is largely devoid of side drain. Effective drainage systems are provided for entire project highway including structures and facilities to avoid water logging. The water from road and adjacent areas shall be intercepted and carried through road side drains to natural outfalls. Only (rectangular covered, open lined rectangular drain have been proposed along the project road at some of built-up sections.

0.10.5 PROPOSED PAVEMENT TYPE & DESIGN

The project road proposed for reconstruction due to gross deficiency in existing geometric design, pavement composition and very poor pavement condition. The BT pavement has been provided except few locations where water logging problems, CC Pavement has been provided.

The BT pavement design thickness for the widening portion and new construction portion are based on IRC: 37-2012 with the required design life.

The flexible pavement has been designed for CBR of 6% and for 10 MSA traffic with bitumen grade VG 40.

Table 0-12: Pavement Thickness

Pavement Layer		Thickness in mm
Bituminous	BC	40
	DBM	65
Granular	WMM	250
	GSB	260
Total Thickness		615

BC = Bituminous concrete, DBM = Dense bituminous macadam, GSB = Granular sub base, WMM = wet mix macadam

Source: Draft Final Report, 2015

Note-1) the existing pavement shall be used as GSB and only 100-150 mm GSB shall be provided.

Rigid pavement has been proposed for problematic locations. The rigid pavement design has been worked out based on the guidelines of IRC 58-2015. The following input parameters have been adopted for the design of the rigid pavements:

- Modulus of Elasticity of Concrete : 31000 N/Sq mm
- Poisson's Ratio: 0.15
- Coefficient of thermal Expansion of Concrete 10×10^{-6}
- Tyre Pressure 8 kg/cm²
- Subgrade CBR 6%
- Design Life (yrs.) 30

Proposed pavement composition for different sections is given in Table.

Table 0-13: Proposed CC Pavement Composition

Particular	Thickness in mm
Thickness of Pavement Quality Concrete (PQC) of M40 grade	250
De-bonding layer of Polythene sheet over DLC of 125 micron	
Thickness of Dry Lean Concrete (DLC) of M15 grade	150
GSB as Drainage Layer	150
GSB as Separation Layer	150*

Existing Road shall be used as GSB Separation Layer in CC Pavement

0.10.6 PROPOSED JUNCTION IMPROVEMENT & PROJECT FACILITIES

The Junctions has been provided where major roads, cross roads join the project road. All major junctions are proposed for improvement as per geometrics laid down in IRC: SP: 41-1994. Due to low traffic, there is no bus bay, truck lay byes, parking areas, service roads and other wayside amenities have been included in the design.

Pedestrian crosswalks at all important intersections and such other locations where substantial conflict exists between vehicular and pedestrian movements (like bus bays, schools and settlement areas etc.) have been provided. The zebra crossings have been provided with warning sign and also informatory sign. On approach to school, warning sign shall be provided and speed limit sign (Refer IRC: SP: 67-2012). Adequate protection works viz. retaining walls, turfing of high embankment slopes, km stones, ROW stones, other safety measures, informatory boards, mandatory road signs, and edge line marking are proposed. Protection work for a length of 2000 m has been proposed along existing ponds and other water bodies. Embankment heights are proposed to increase at some locations.

The project roads have been provided with all safety features such as elaborate system of signs and markings, cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc. Guidelines given in IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications have been used for providing these items.

A proper traffic diversion plan during construction shall be prepared as per IRC: SP: 55-2014 for the entire project roads. Separate traffic diversion plan shall be prepared for structures and CD works. The execution of the project road should be planned such that inconvenience to road users is minimum. The width of temporary diversion should be equal to the width of existing carriageway but not less than 5.5 m. Typical Traffic Control Zone based on IRC:SP:55-2014.

As project enhancement measures (i) most of the borrow areas will also be converted in ponds. This will directly meet the various water requirements of local people and also augment the groundwater condition and (ii) plantation is

proposed at 1:3 bases.

0.11 ENVIRONMENTAL IMPACT ASSESSMENT

The Initial Environmental Examination has been carried out as per National Capital Region Planning Board Environmental and Social Management Systems (ESMS) adopted by NCRPB in April 2010. Project categorization has been done using Rapid Environment Assessment (REA) checklist after screening survey and initial consultations. Project interventionism limited to improvement and widening of existing road without any bypass/new alignment. The project road does not pass through or located near wildlife sanctuary, national park, protected area network or any other similar eco-sensitive areas. Most of impacts are mainly temporary and localized in nature which can be mitigated by effective implementation of Environmental Management Plan (EMP) included with the IEE. Hence, the project has been categorized as Category 'E-2' as per ESMS, April 2010. The ESMS clarifies NCRPB's environmental and social policies; and safeguard screening, categorization, and review procedures.

As per environmental impact assessment Notification 2006 and its amendments of Ministry of Environment, Forests and Climate Change (MOEFCC), all Village Roads improvement have been exempted from the purview of the Environmental Impact Assessment notification, 2006 and subsequent amendments.

0.12 SOCIAL IMPACT ASSESSMENT

Social Impact assessment has been carried out as per LA act 2013 and NCRPB Social Policy. 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 Rajasthan and NCRPB Social Policy adopted for the project. As per NCRPB Social Policy the Proposed project comes under Categorization "S-3". Hence No Resettlement Plan/Short Resettlement Plan need to be prepared.

0.13 LAND ACQUISITION & UTILITIES SHIFTING

As per the Land a record collected from the Revenue Department GoR, PWD has 15-20 m RoW in most section of project highway. As per the improvement proposed on the project corridor no land acquisition is required

for the project. Some electric poles and telephone poles need to be shifted.

0.14 CONSTRUCTION MATERIAL AND SOURCING

Due to favorable topography (rolling/undulating), earth material for the project is available in abundant close to the sub-project road. Soil samples of identified borrows areas mostly conforms to MoRTH specifications and will be operated and rehabilitated as per IRC: 10-1961. Stone aggregates will be sourced from existing licensed quarries. However, contractor may use any source subject to compliance of statutory/legal requirements. Sand is also available in plenty in nearby the project road. Water requirement for construction will be met through surface water sources as far as possible.

The sub-project is not located within 100 km distance from operational thermal power plants and hence fly-ash utilization is not mandatory as per Fly-ash Notification 2003.

0.15 PROJECT COST ESTIMATES

0.15.1 QUANTITIES

As per the detailed designs, the quantities of various items have been worked out for various components. Quantities of same type of the items have been added to arrive at the final quantity as per PWD & NCRPB guidelines.

0.15.2 RATE ANALYSIS

The rates for estimate have been taken from the BSR PWD Circle Alwar 2016.

0.15.3 COST ESTIMATES

The project cost, inclusive of cost of construction, physical contingencies, Quality Control and all other costs connected with construction of the project road. The brief of the project cost is given in following Table.

Table 0-14: Capital Cost Estimates of Project

Sl. No	Improvement Proposal	Amount in Rs	Amount in Lacs
1	SITE CLEARANCE AND DISMANTLING	984908	9.85
2	EARTH WORKS	22449341	224.49
3	SUB BASE AND BASES COURSE	65582852	655.83
4	FLEXIBLE PAVEMENT	83041159	830.41
5	CC PAVEMENT	19364709	193.65
6	ROAD FURNITURES	11164398	111.64

7	RCC DRAIN WORK, PROTECTION WORK	7477429	74.77
8	STRUCTURES	32145724	321.46
	Sub Total		2422.11
	Add 3 % WC & Contingencies	3%	72.66
	Add 1% QC	1%	24.22
			2518.99
	Add Land Acquisition		0.00
	Add Forest Diverstion		20.00
	Add Utilities Shifting		6.00
	Add Environmental Monitoring Cost		23.42
			2568.41
	Add 13 % for agency charges	13%	333.89
	Grand Total		2902.30
	Road length (Km)	24.87	
	Cost per Km in Lacs		116.70

0.16 FUNDING & FINANCIAL ANALYSIS

0.16.1 SUBMISSION OF PROJECT REPORTS & LOAN SANCTIONING PROCEDURE

In accordance with Section 7(e) and B {e) of the NCRPB Act, 1985, NCRPB provides financial assistance to the constituent states and their implementing agencies for infrastructure development projects in the NCR and CMAs. Financial assistance is approved by the NCRPB's Project Sanctioning & Monitoring Group (PSMG)-1. The projects, however, need to be in line with the Regional Plan of NCR Planning Board and the respective Sub regional Plan and Master Plan prepared by the concerned State Govt. I their departments, as the case may be.

The agency seeking financial assistance need to prepare and submit Detailed Project Reports covering the technical, financial, environmental and social aspects. The environmental and social aspects need to be as per the Environment & Social Management System (ESMS) adopted by NCRPB since April 2010. As per this, the project is categorized with respect to the Environment and Social Aspect based on the duly filled Screening Checklist to be submitted by borrowing agency Alongside the project needs to have the necessary administrative and financial approvals of the State-Govt.

The Borrowing / implementing Agency should submit request for loan assistance in prescribed loan application along with three sets of Detailed Project Reports (including one advance copy to NCRPB) and a soft copy to

the NCRPB Delhi through the respective . NCR Planning & Monitoring Cells of the participating States. The -Cell after appraising the project, in terms of conformity of Regional/Sub-Regional//Functional Plan and Master Plan of Town. Feasibility Report in context of regional and submit the Project Report to the Board along with observations

0.16.2 ELIGIBLE AGENCIES TO BORROW

- State .Government Departments of Urban Development Housing or any Department Agency of the State Government implementing infrastructure projects related to Power, Water, Sewerage, Road Transport (Roads & ROBs, Bus Stands; Transport Nagar etc.), Drainage, SWM or public Health,
- Through concurrence of Finance Department of concerned State Government to get funding through State budget for specific project with Letter of Comfort (LoC).
- Development Authorities I Urban Improvement Trusts.
- State Industrial Development Corporations.
- State Power authorities and distribution agencies
- Municipal -Corporation/Municipal Councils/ Notified area Committees I Nagar Nigams /Nagar Panchayats/ Nagar Palikas which are implementing the Sub-Regional Plans and the Project Plans in NCR or developing a .counter-magnet town/city .

0.16.3 TYPE OF PROJECTS ELIGIBLE FOR FUNDING

- Transport Sector: - Roads widening/ Strengthening /Tunnels/ Bridges/Flyovers, Metro and RRTS etc.
- Water Supply and Sanitation Sector:-
 - Water Supply (Source Development Treatment storage and distribution)
 - Drainage and Sewerage Collection & Disposal/Solid Waste ManagementLow Cost Sanitation etc.
- Power Sector: --Generation, HT & LT Transmission and Distribution.
- Social Infrastructure projects:- Hospitals, Educational institutions, Recreation 'Facility, Abattoir etc.
- Other schemes as the Project Sanctioning and Monitoring -Group (PSMG) may find compatible with the objectives of the NCR RP- 2021.

0.16.4 MODE OF SANCTION

- The DPRs are appraised by the available empanelled appraisal agencies/consultants and NCR Planning Board
- The preliminary observations obtained are forwarded to implementing agencies for incorporation/revision of DPRs.
- Replies submitted by implementing agencies are discussed with Appraisal agency and implantation agency for arriving at mutual agreement on the contents/revisions required in DPRs.
- On receipt of appraisal Report from the empanelled National Institutes are taken up-in the Project Sanctioning and Monitoring Group (PSMG) Meeting under the chairmanship of Secretary, Ministry of Urban Development.

0.16.5 FINANCIAL TERMS AND CONDITIONS

The brief the Financial terms and conditions of NCRPB loan as per the 16-July, 2016.

A. Financing Pattern

- Loan from NCRPB- upto 75% of the estimated cost of the project.
- Grant-in-aid-- upto 15% of the sanctioned project cost for water supply and sanitation projects, on completion, subject to fulfillment of terms & condition laid down by Board.
- State-Govt/Implementing agency -- Remaining share.

B. Present Rate of interest

Type of Project /Category	Interest rate *
Priority Infrastructure Projects viz. Water supply, Sewerage, Sanitation, Drainage, SWM and Roads , ROB's & Flyover, RUB,	7.0 % PA
Metro, Rapid Rail, RRRT	7.0 % PA
Power Sector (transmission, distribution and Generation)	7.5 % PA
Land Develoment & Other Infrastructure Projects	8.5 PA

Incentive of 0.25% by reduction in interest rate for timely payment of loan instalments, strictly as per repayment schedule, shall be available

C. Repayment of Loan/Interest-

The loan along with interest shall be repaid by the Borrower annually on or before the anniversary date of the drawl of loan as per repayment schedule. Each instalment of loan shall be treated as separate loan for the purpose of repayment of Principal and payment of interest.

Tenure for repayment of loan

Moratorium period for payment of principal

Upto 15 year loan with 3 year moratorium for public health and environment related infrastructure sector of water supply, sewerage & sanitation including drainage, solid waste management projects).

Moratorium period for payment of interest - Nil

Penalty, Pre-Payment Charges, etc.

Penal rate of interest - 2.75% over and above the normal -rate of interest for the delayed period on overdue amount.

Prepayment Charges - 1% of the principal loan amount outstanding.

D. Guarantee and Securities:

In case of loan to State Government - No formal Securities only undertaking from 'finance Secretary regarding appropriate provision in annual budget for repaying the loan.

In case of ULB / Prostate/s -'Escrow Agreement, 'AND' State Govt. guarantee 'OR' Bank guarantee 'OR' Charge on Assets by way of mortgage/ hypothecation.

0.16.6 GENERAL TERMS AND CONDITIONS

- In case where land acquisition is involved in project, loan will be released after confirmation about possession of land, completing -ESMS requirement i.e. Initial Environment Examination (IEE) Preparation / implementation of Environment Management Plan (EMP), Pre-Preparation/ implementation of Short resettlement plan per NCRPB's ESMS and obtaining clearance from the state environment authorities and other statutory clearances.

- The borrower shall maintain separate accounts of receipts and expenditure in respect of all these schemes and shall furnish to the Board every year till the loan is fully repaid.
- The borrower shall not invest any part of the loan amount advanced by way of deposits, loans, share capital or otherwise, without the prior permission of the Board.
- The borrower shall make available for inspection of the board and/or its nominee (s) all its books of accounts and other books and documents as mentioned by it and/or required to be maintained by it under any law, bye-laws or rules of the borrower.
- The funds released for one scheme should not be diverted to other scheme and the borrowing agency must maintain separate books of accounts for each scheme.
- During the course of execution or on completion of the project, whichever is earlier, if the Implementing Agency comes to know that there is likely to be reduction in the sanctioned cost estimates of the various components, it shall be the obligatory on the part of the Implementing Agency to refund immediately the excess amount of loan obtained from the Board calculated on the pro-rata basis in respect of the decreased cost of the project.
- The Implementing Agency shall submit periodical progress reports on monthly/quarterly basis in the prescribed form.

0.17 FINANCIAL ANALYSIS

As per the Policy Decision, GOR not envisaged to put the toll collection system on the proposed development of road. In the light of the above it is clear that all the repayment of the loan shall be done the State government through State consolidated Fund.

0.18 ECONOMIC ANALYSIS

The Economic analysis of the proposed bypass has been carried out as per IRC: SP-30 combined with updated Road User Cost Study RUCS-2001. The EIRR of the project is more than minimum threshold level of 12 %.

0.19 CONCLUSIONS & RECOMMENDATIONS

The Detailed Project Report revealed that the after the development of project road it shall improve transport efficiency Alwar & road network of Rajasthan. This will be realized by (i) improving the region & highway network, (ii) facilitating safe and appropriate road usage, (iii) increasing efficiency of transport services and (iv) Enhancing GoR capacity for road asset development and management. Project immediate outcome will be improved

accessibility to social services and markets, increased fuel efficiency, reduced travel time, accidents, vehicle emissions and better employment opportunities outside agriculture, both through improved access to economic centers and increased industrial activities in the project area. Apart from this the developments of this road link enhance the land values many fold along the proposed Project Road.

The proposed project road will help in achieving the objectives of the NCR Regional Plan and the project is in conformity with the Rajasthan Sub-Regional Plan. The Project road meet the present and future requirements of the area in terms of services and utilities. Hence, looking at above potentials it is recommended that this Improvement of road may be taken from the NCR Loan Funding.