PROJECT NOTES

0.1 BACKGROUND

The Indian Academy of Highway Engineers (IAHE) has been entrusted with the assignment of Project Management Consultancy Phase I including preparation of Detailed Project Report of selected stretches/corridors of National Highways for Two laning / Four laning with paved shoulder configuration. As part of this endeavour, The Indian Academy of Highway Engineers (IAHE) has decided to rehabilitate and upgrade the existing National Highway section from Shahpura – Alwar section of NH-248A in the State of Rajasthan to two/ four lane with paved shoulders configuration. This segment of NH-248A, from Shahpura to Alwar, hereafter termed as Project Highway.

Project road is divided into following two construction packages based on land availability:

Construction Package

Package	Existing Chainage		Design Chainage		Length (km)	Total Length (m)	Remarks
	From	To	From	To			
I	2+153	16+600	2+320	16+644	14324	44274	Jogipura to Viratnagar
	22+583	49+495	23+170	49+419	26249		Viratnagar to Tal Briksha
	72+845	76+609	73+520	77+221	3701		Akbarpur to Sahori
II	Km 197+840 of NH-8	2+153	0+000	2+320	2320	38864	Jogipura Realignment
	16+600	22+583	16+644	23+170	6526		Viratnagar Bypass
	49+495	72+845	49+419	73+520	24101		Tal Briksha Realignment to Akbarpur section
	76+609	Bypass	77+221	83+138	5917		Alwar Bypass
Total Length (m)						**83138**	

0.2 PROJECT DEVELOPMENT DESCRIPTIONS

0.2.1 General

The Shahpura – Alwar Road section of NH-248A, starts from km 0+000 near Shahpura at T-junction at km. 197+250 of NH-8 and ends at km 87+225 at the junction of Mega Highway with SH-25 at Alwar . The project highway in Jaipur district has a 7.0 m carriageway wide carriageway. About 2.0 km road in Alwar district has 4-lane dual carriageway with 1.0 m wide median. Remaining 60 km of the project road in Alwar district has 5.5 m wide carriageway i.e. intermediate lane configuration. A summary of the project corridor generally consist of the following configuration is given in ***Table 0.1.***

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Table 0.1: Configuration of Project Corridor

Sl. No.	Description	Length (km)	% of Total Length
1.	7.0m carriageway with 1.5m earthen Shoulder	24.8	28.4%
2.	5.5 m carriageway with 1.5m Earthen Shoulder	59.4	68.1%
3.	2 x 7.0 m carriageway with 1.0m Median	3.025	3.5%
	TOTAL	**87.225**	**100.0%**

0.2.2 District and Nodal Settlements on the Project Road

Project road is traverse through two district of Rajasthan state

Sl. No.	District	Existing Chainage		Length (km)
		From	To	
1.	Jaipur	0.000	24.800	24.800
2.	Alwar	24.000	87.225	62.425
TOTAL				**87.425**

Main settlements along the project road are asYogipura, Bilwari, Viratnagar, Ismailpur, Ghata Bandrol, Thanaghazi, Talbriksha, Kushalgarh, Akabarpur, Alwar.

0.2.3 Traffic Volume

The summary of the average annual expected daily traffic for the project stretch is given in **Table 0.2.**

Table 0.2: Annual Average Daily Traffic (AADT)

Vehicle type	Homogeneous section		
	I	II	III
2-Wheeler	2700	1379	3338
Auto Rick.	0	2	5
Car/ Jeep/ Van	1,924	606	2,338
Taxi	0	0	0
M. Bus	43	8	29
Bus	186	47	203
LMV	406	258	384
LCV	204	196	141
2AV	146	232	154
3AV	251	312	223
MAV	351	429	335
HCM	3	1	4
Agricultural Vehicle	95	29	86
Total Vehicles	6,321	3,504	7,256
Total Vehicles in PCU	7,780	5,678	8,262

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0.2.4 Right of Ways (ROW)

Existing ROW of project road is varies from 12m to 58m and proposed ROW will be 30m (maximum) for widening of existing road and minor realignments and 45m in bypasses.

0.2.5 Widening Scheme

Maximum portion of project road concentric widening has been proposed. Wherever concentric widening is not possible/ due to geometry or land constraints (Builtup areas) realignment/ bypasses has been proposed. Social, Technical and Economical study is carried out and possible efforts were made to avoid the Protected Area and Forest blocks but big patches of STR and Ghata RF and Bilwari RF block can't be avoid. It is only the shortest route is available between Alwar and Capital City Jaipur.

Typical cross-section and proposed widening scheme for the project road is presented in **Fig 0.1 to Fig 0.6 and Table 0.3.**

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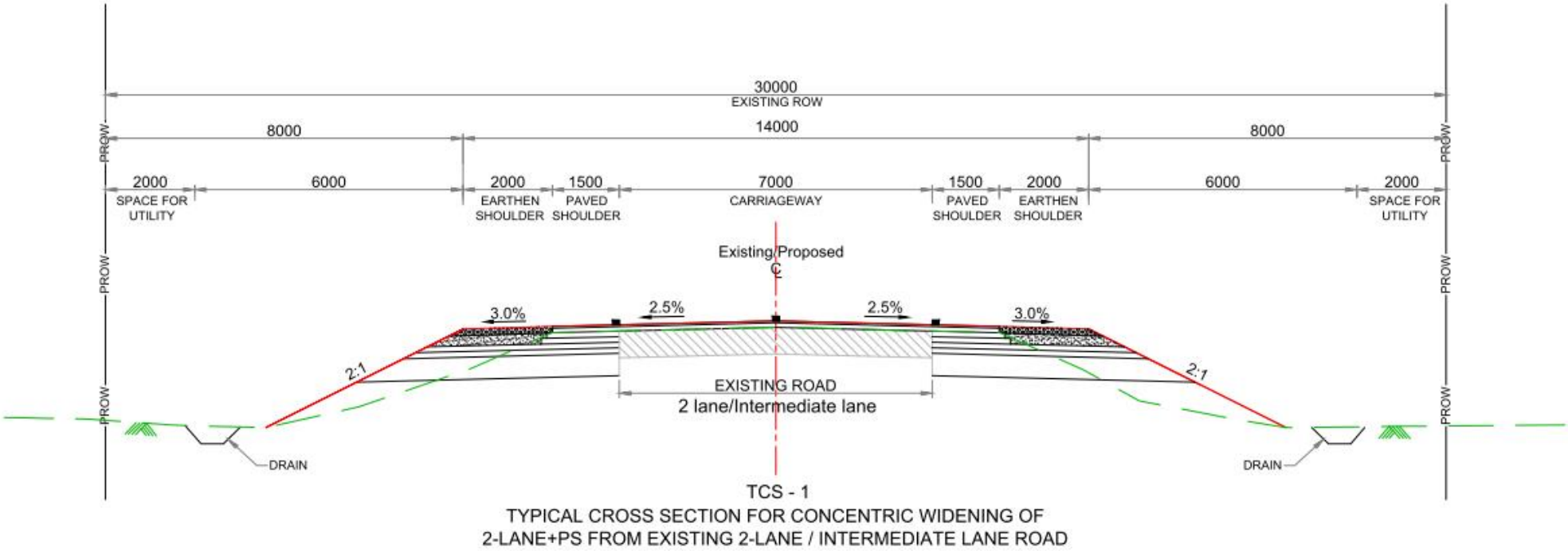

Figure 0.1

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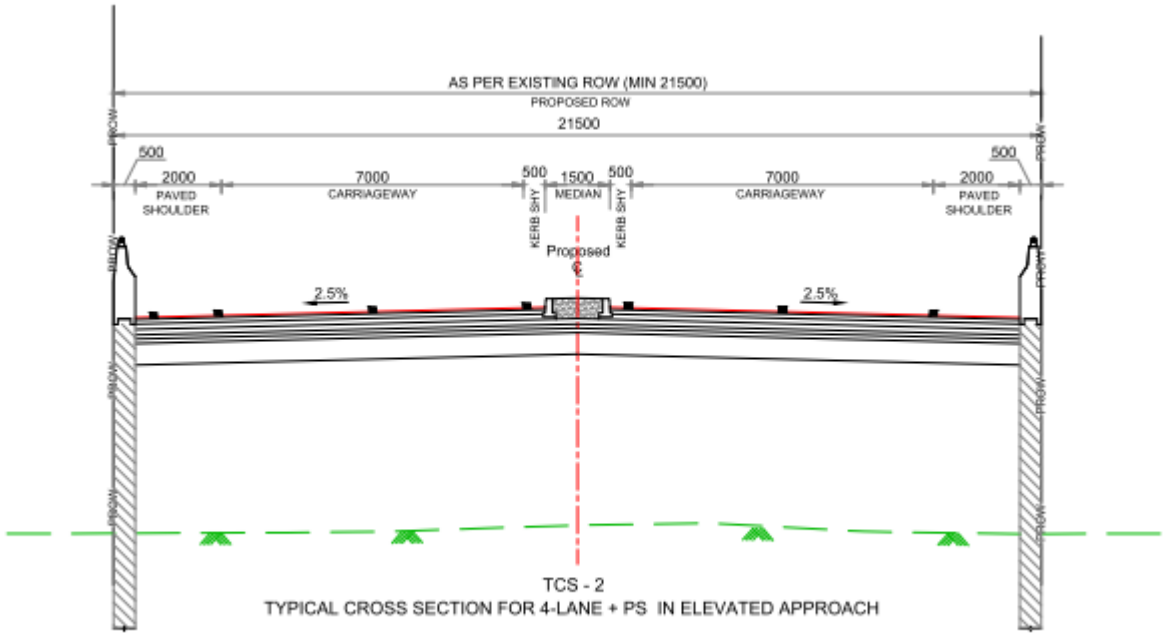

Figure 0.2

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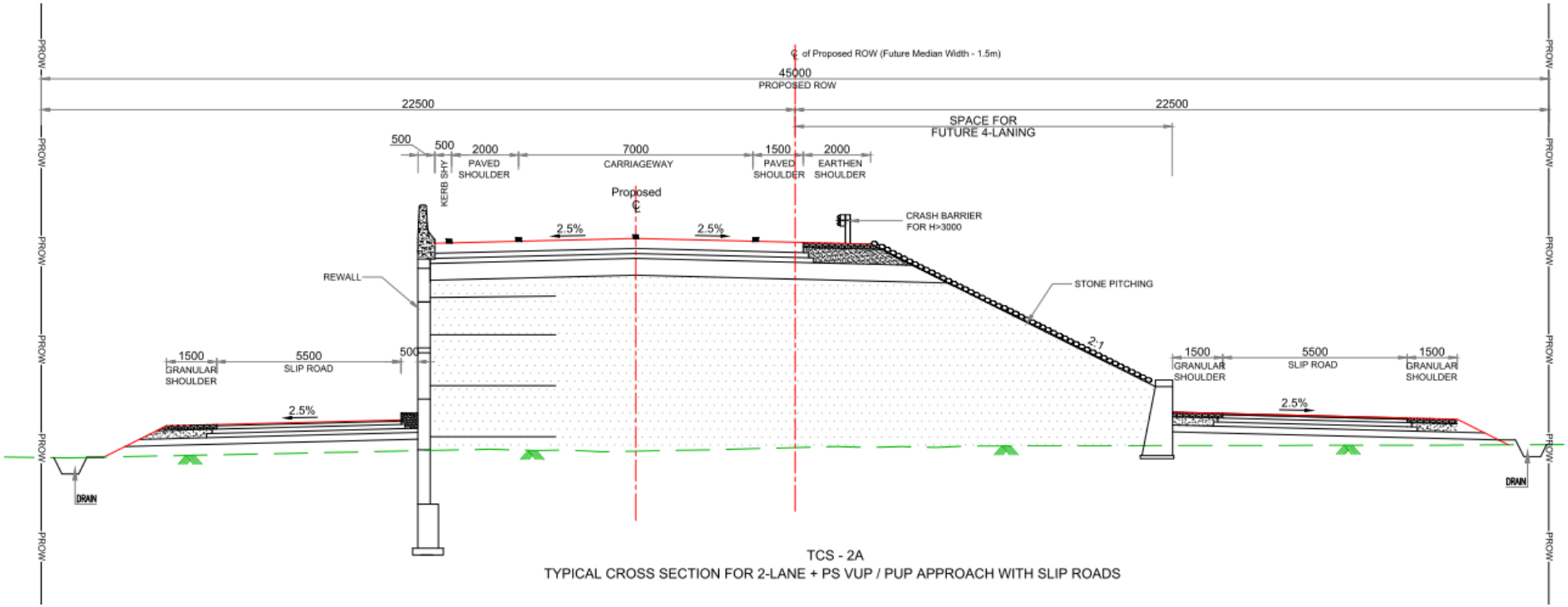

Figure 0.3

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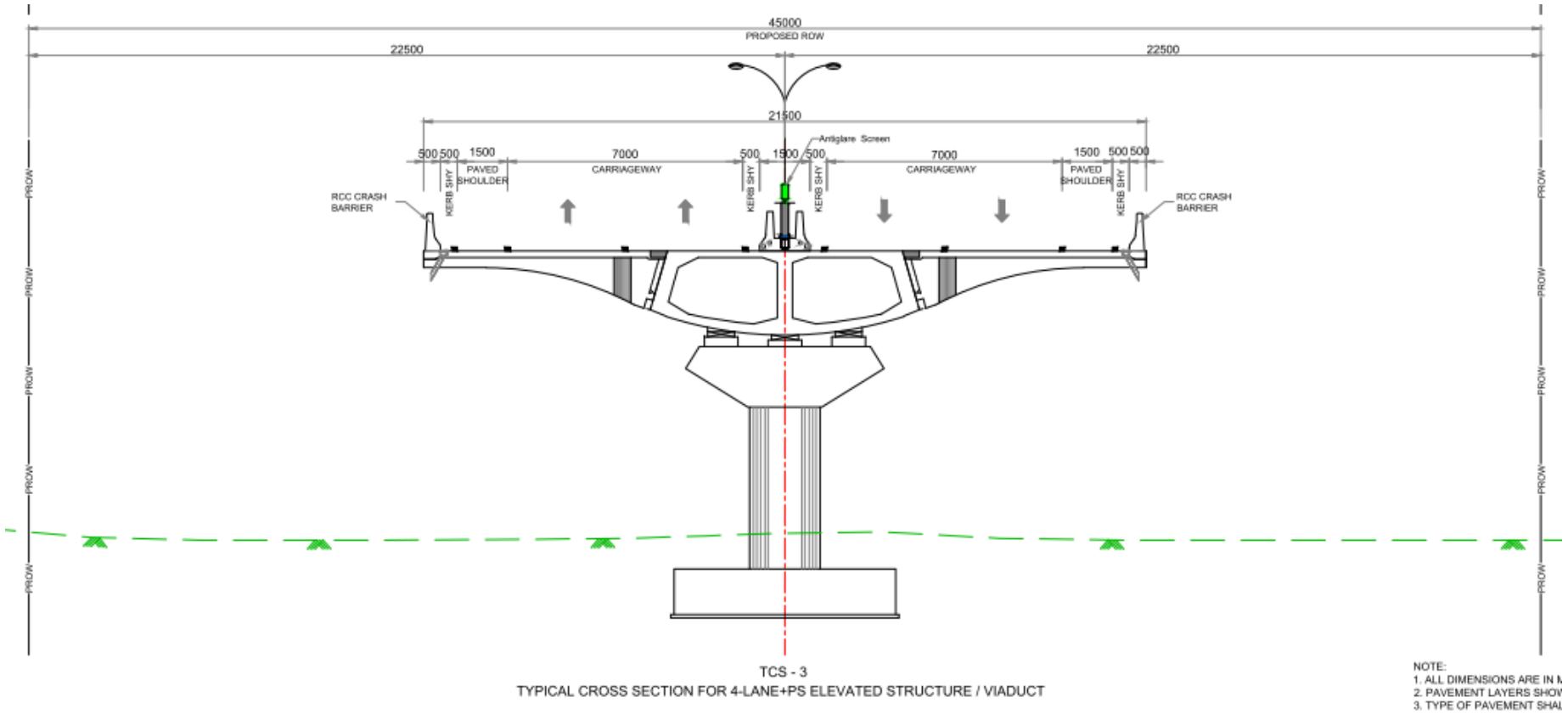

Figure 0.4

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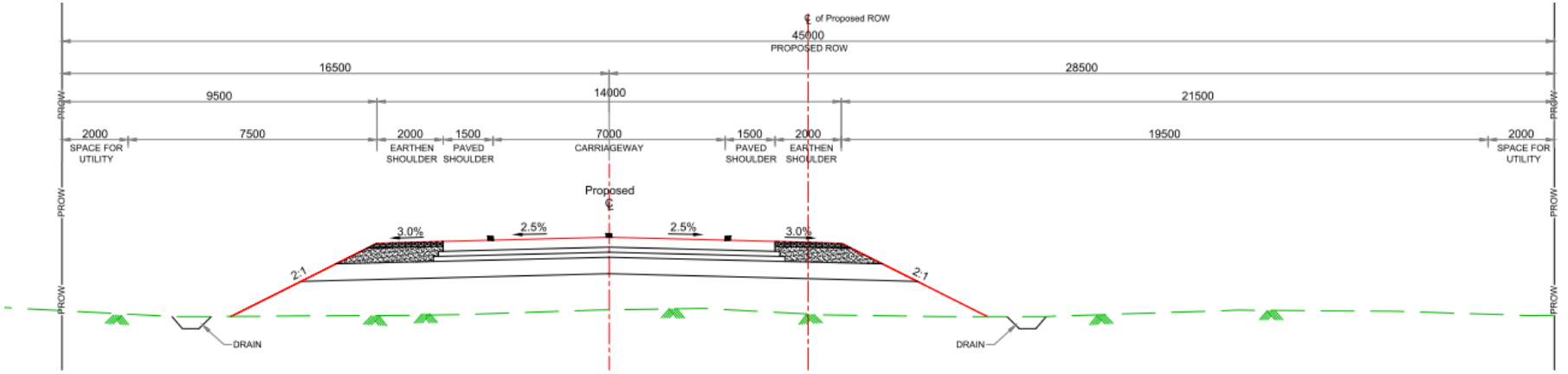
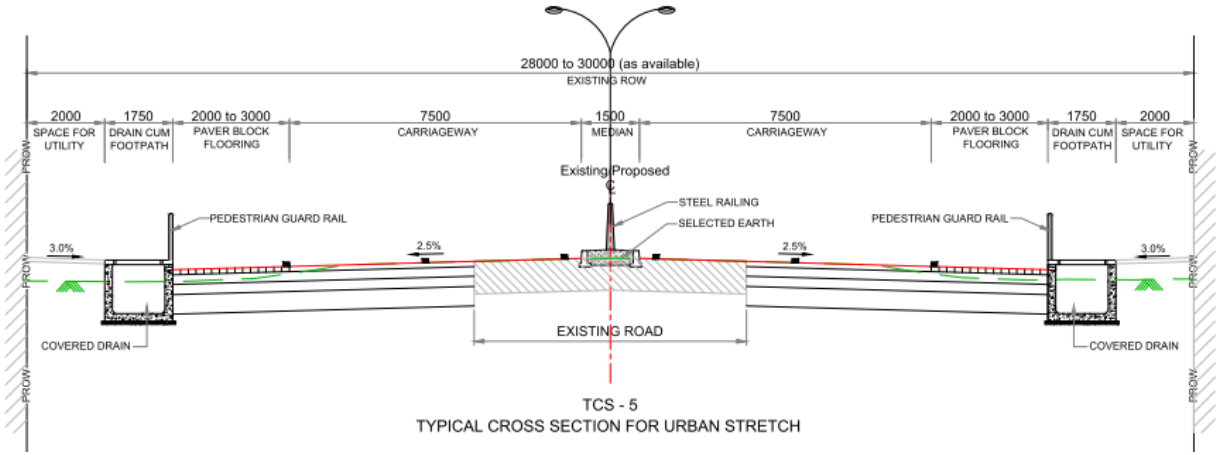


TCS - 4
TYPICAL CROSS SECTION FOR 2-LANE+PS BYPASS / REALIGNMENT

Figure 0.5



TCS - 5
TYPICAL CROSS SECTION FOR URBAN STRETCH

Figure 0.6

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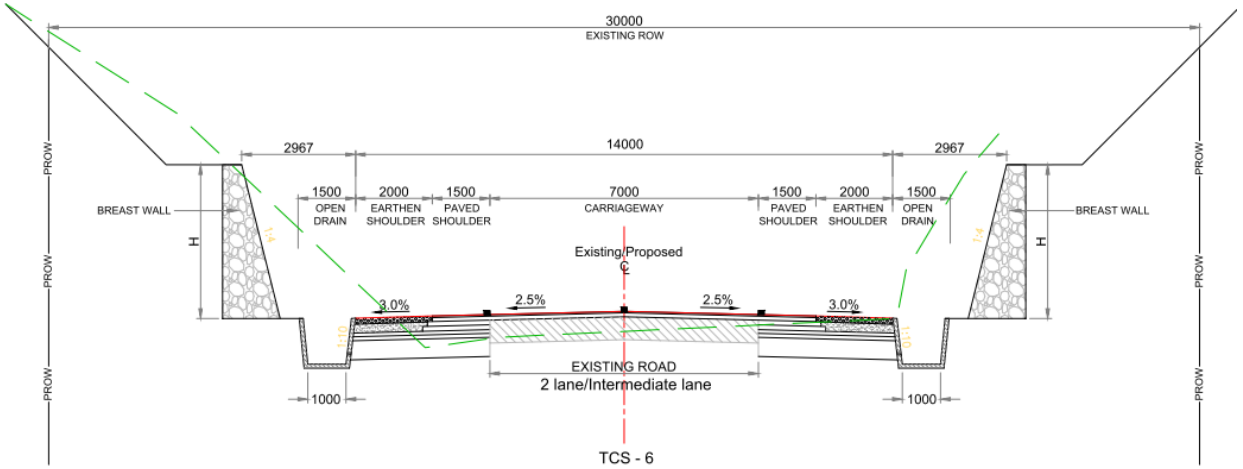
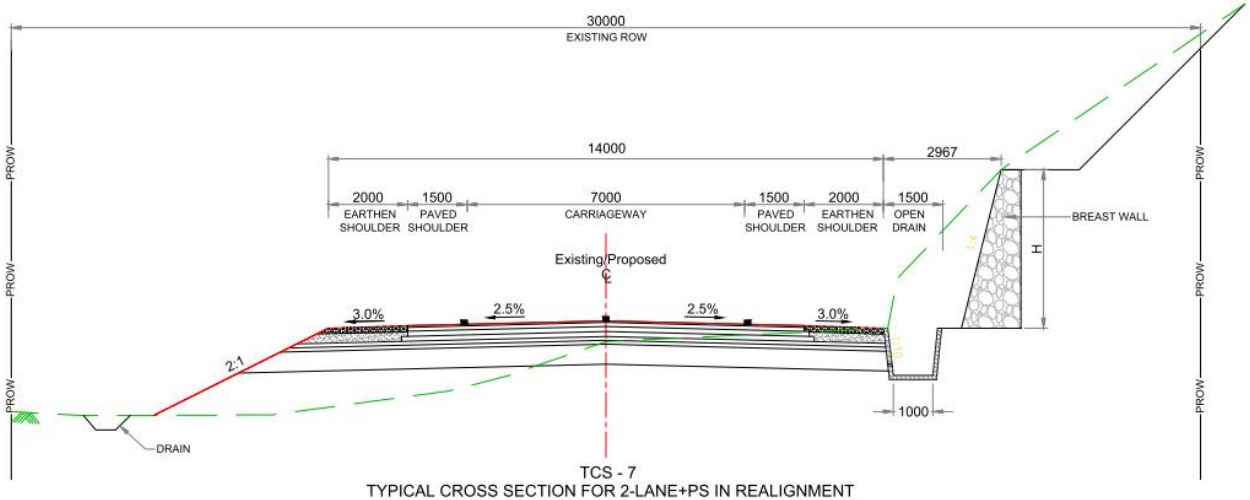


TCS - 6
TYPICAL CROSS SECTION FOR CONCENTRIC WIDENING OF
2-LANE+PS FROM EXISTING 2-LANE / INTERMEDIATE LANE ROAD IN
GHAT SECTION

Figure 0.7



TCS - 7
TYPICAL CROSS SECTION FOR 2-LANE+PS IN REALIGNMENT
WITH HILL CUTTING ON RHS

Figure 0.8

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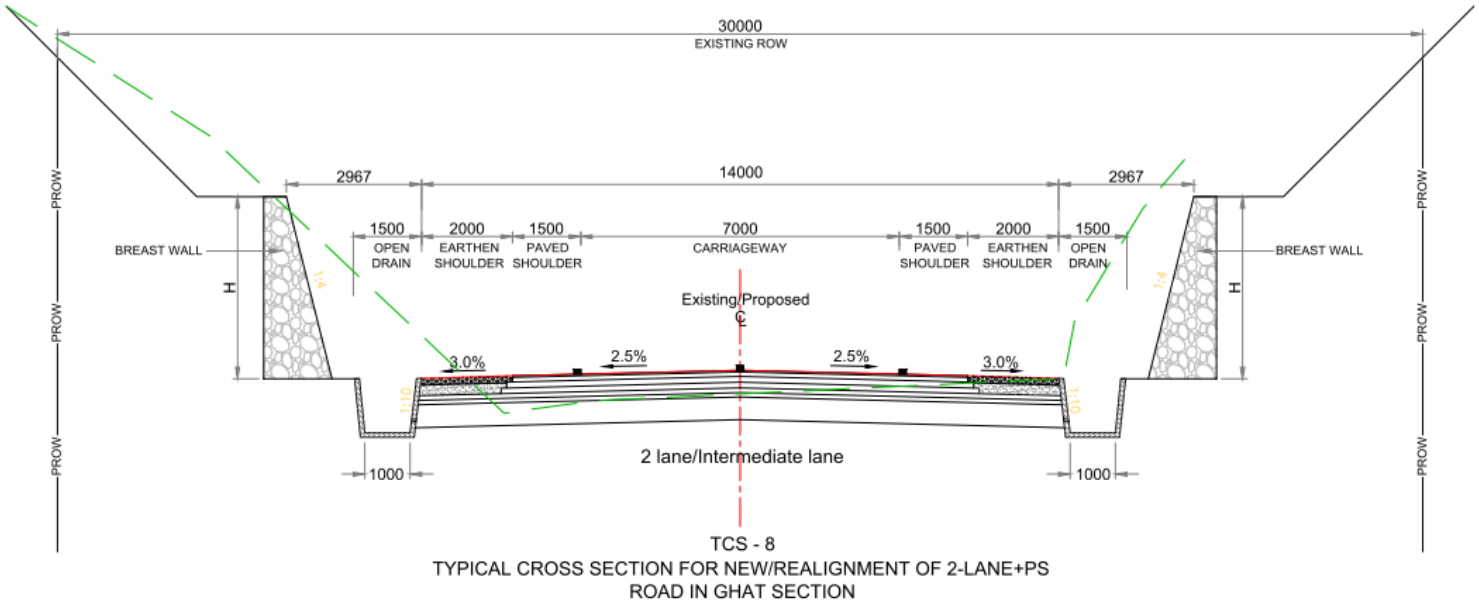

Figure 0.9

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Table 0.3: Widening Schedule

Sl. No.	Existing Ch.		Design Chainage		Length (m)	Proposed TCS	TCS Description	Remark/Widening Side
	From	To	From	To				
Package-I								
1	2+153	2+573	2+320	2+740	420	TCS-5	Typical cross section for urban stretch	Concentric widening
2	2+573	6+095	2+740	6+260	3520	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
3	6+095	6+730	6+260	6+895	635	TCS-5	Typical cross section for urban stretch	Concentric widening
4	6+730	10+230	6+895	10+380	3485	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
5	10+230	10+720	10+380	10+870	490	TCS-6	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road in Ghat Section	Concentric widening
6	10+720	10+870	10+870	11+020	150	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
7	10+870	11+579	11+020	11+650	630	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Realignment
8	11+579	12+250	11+650	12+320	670	TCS-5	Typical cross section for urban stretch	Concentric widening
9	12+250	14+815	12+320	14+870	2550	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
10	14+815	16+290	14+870	16+335	1465	TCS-6	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road in Ghat Section	Concentric widening
11	16+290	16+600	16+335	16+644	309	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
12	22+583	23+923	23+170	24+551	1381	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
13	23+923	25+905	24+551	26+531	1980	TCS-5	Typical cross section for urban stretch	Concentric widening
14	25+905	26+284	26+531	26+911	380	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening

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15	26+284	Realignment	26+911	26+990	79	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Realignment
16	Realignment	Realignment	26+990	27+177	187	TCS-7	Typical cross section for 2-lane+PS in Realignment with hill cutting on RHS	Realignment
1	Realignment	26+614	27+177	27+219	42	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Bypass/Realignment
2	26+614	28+824	27+219	29+419	2200	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
3	28+824	28+925	29+419	29+520	101	TCS-5	Typical cross section for urban stretch	Concentric widening
4	28+925	29+324	29+520	29+919	399	TCS-5	Typical cross section for urban stretch	Concentric widening
5	29+324	32+827	29+919	33+419	3500	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
6	32+827	Bypass	33+419	35+299	1880	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Thanagazhi Bypass
7	Bypass	Bypass	35+299	36+199	900	TCS-2A	Typical cross section for 2-lane +PS VUP approach with slip road	VUP (35+750) on Bypass
8	Bypass	37+822	36+199	37+819	1620	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Thanagazhi Bypass
9	37+822	48+535	37+819	48+519	10700	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
10	48+535	48+895	48+519	48+819	300	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Realignment
11	48+895	49+495	48+819	49+419	600	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
12	72+845	73+503	73+520	74+121	601	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Realignment
13	73+503	75+036	74+121	75+651	1530	TCS-5	Typical cross section for urban stretch	Concentric widening
14	75+036	76+609	75+651	77+221	1570	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
Total Length (m)					**44274**			

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Package-II								
1	Km 197+840 of NH-8	2+153	0+000	2+320	2320	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Jogipura Realignment on RHS of existing road
2	16+600	Viratnagar Bypass	16+644	18+377	1733	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Viratnagar Bypass on RHS of existing
3	Viratnagar Bypass	Viratnagar Bypass	18+377	19+277	900	TCS-2A	Typical cross section for 2-lane +PS VUP approach with slip road	VUP (18+827) on Bypass
4	Viratnagar Bypass	22+541	19+277	23+170	3893	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Viratnagar Bypass on RHS of existing
5	49+495	51+750	49+419	52+692	3273	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Realignment at Tal Briksh
6	51+750	53+767	52+692	54+710	2018	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
7	53+767	54+216	54+710	55+160	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
8	54+216	54+577	55+160	55+520	360	TCS-3	Typical cross section for 4-lane+ PS Elevated structure / Viaduct	Elevated Structure
9	54+577	55+027	55+520	55+970	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
10	55+027	55+435	55+970	56+378	408	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
11	55+435	55+885	56+378	56+828	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
12	55+885	56+857	56+828	57+800	972	TCS-3	Typical cross section for 4-lane+ PS Elevated structure / Viaduct	Elevated Structure
13	56+857	57+307	57+800	58+250	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
14	57+307	61+364	58+250	62+298	4048	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
15	61+364	61+585	62+298	62+518	220	TCS-5	Typical cross section for urban stretch	Concentric widening

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16	61+585	Realignment	62+518	62+586	68	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Curve Improvement
17	Realignment	Realignment	62+586	62+766	180	TCS-8	Typical cross section for New/Realigned 2-lane+PS in Ghat Section	Curve Improvement
18	Realignment	Realignment	62+766	63+228	462	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Curve Improvement
19	Realignment	63+086	63+228	63+884	656	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
20	63+086	63+546	63+884	64+334	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
21	63+546	64+014	64+334	64+802	468	TCS-3	Typical cross section for 4-lane+ PS Elevated structure / Viaduct	Elevated Structure
22	64+014	64+431	64+802	65+218	416	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
23	64+431	64+820	65+218	65+578	360	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Curve Improvement
24	64+820	66+102	65+578	66+859	1281	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
25	66+102	66+763	66+859	67+518	659	TCS-5	Typical cross section for urban stretch	Concentric widening
26	66+763	67+494	67+518	68+250	732	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
27	67+494	67+943	68+250	68+700	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
28	67+943	68+660	68+700	69+348	648	TCS-3	Typical cross section for 4-lane+ PS Elevated structure / Viaduct	Elevated Structure
29	68+660	69+110	69+348	69+798	450	TCS-2	Typical cross section for 4-lane +PS Elevated structure approach	Approach
30	69+110	69+539	69+798	70+227	429	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
31	69+539	69+875	70+227	70+550	323	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Curve Improvement

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32	69+875	72+746	70+550	73+421	2871	TCS-1	Typical cross section for concentric widening of 2-lane+PS from existing 2-lane / intermediate lane road	Concentric widening
33	72+746	72+845	73+421	73+520	99	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Curve improvement on LHS
34	76+609	Bypass	77+221	83+138	5917	TCS-4	Typical cross section for 2-lane+PS Bypass / Realignment	Alwar Bypass on RHS of existing
Total Length (m)					**38864**			

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0.2.6 Proposal for Bypasses/Realignment

The summary for proposed Bypasses /Realignments is tabulated below:

Table 0.4: Summary of Bypasses/Realignments

Sl. No.	Name of Bypass/ realignment	Existing Chainage		Design Chainage		Length (km)
		From	To	From	To	
Package – I						
1	Thanagazhi Bypass	32+827	37+822	33+419	37+819	4.40
Package-II						
1	Jogipura Realignment	Km 197+840 of NH-8 (Delhi Jaipur Highway)	2+153	0+000	2+320	2.32
2	Viratnagar Bypass	16+600	22+541	16+644	23+170	6.526
3	Tal Briksh Realignment	49+495	51+750	49+419	52+692	3.273
4	Alwar Bypass	76+609	Bypass	77+221	83+138	5.917

0.2.7 IRC: 37-2012 Method of New Flexible Pavement Design

Flexible pavement has been proposed for the project road excluding all bypasses.Hence the design of the new flexible pavement has been carried out following IRC: 37-2012.

The flexible pavement thicknesses required is given in ***Table 0.5.***

Table 0.5: Flexible Pavement Thickness for Project Road

HS	Design Chainage		Length (km)	Design traffic (MSA)	Effective Subgrade CBR	Pavement Thickness (mm)				Total thickness (mm)
						Shahpura-Alwar section				
	From	To				BC	DBM	WMM	GSB	
I	0+000	29+500	29.5	35	12%	40	65	250	200	555
II	29+500	63+000	33.5	42		40	70	250	200	560
III	63+000	83+138	20.138	34		40	65	250	200	555

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0.2.8 IRC: 58-2015 Method of Rigid Pavement Design

At Toll Plaza locations provision of rigid pavement is given and pavement composition is determined as per IRC: 58-2012

Pavement composition thickness for rigid pavements at Toll plaza locations is given in Table 0.6.

Table 0.6: Rigid Pavement Composition

Material Type	Thickness (mm)
Pavement Quality Concrete (M-40)	300
Dry Lean Concrete (M-15)	150
Granular Sub-base	150
Subgrade	500

0.2.9 Junction Improvement

There are 9 major and 40 minor junctions on the existing road. Out of these 23 nos. of junctions have been proposed for at grade improvement while 16 nos. have been proposed for no improvement due to bypasses and realignments.

There are 27 nos. of new junctions that are proposed due to new bypasses and realignments. Out of these 2 nos. of junctions have been proposed for grade separation while the remaining 25 nos. have been proposed for at grade improvement.

The detailed improvement proposal is presented in Table 0.7.

Table 0.7: Improvement Proposal for Existing junctions

Sl. No.	Existing Chainage	Design Chainage	Type	Category of Cross Road	LHS		RHS		Major/ Minor	Proposed Improvement
					Towards	Type	Towards	Type		
Package-I										
1	2+267	2+433	T	VR			Madno Ka Bas	CC	Minor	At-Grade
2	2+287	2+453	T	VR			Village	CC	Minor	At-Grade
3	3+115	3+281	T	VR	Khatolai	BT	-	-	Minor	At-Grade
4	5+400	5+565	T	VR	-	-	Bhagawas Chourasi	BT	Minor	At-Grade
5	5+460	5+625	T	VR	Jawan Pura	BT			Minor	At-Grade
6	6+420	6+585	T	VR	Viratnagar	BT			Minor	At-Grade
7	8+260	8+420	T	VR	Nayakuan	CC			Minor	At-Grade
8	8+943	9+097	T	VR	Luhakana	BT			Minor	At-Grade

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Sl. No.	Existing Chainage	Design Chainage	Type	Category of Cross Road	LHS		RHS		Major/ Minor	Proposed Improvement
					Towards	Type	Towards	Type		
9	9+670	9+820	T	VR	Maliyon Ki Dhani	BT			Minor	At-Grade
10	10+616	10+766	T	VR	Beelwadi	BT			Minor	At-Grade
11	11+525	11+595	T	VR			Pratapgarh	BT	Minor	At-Grade
12	24+100	24+735	T	VR	Ismailpur	BT			Minor	At-Grade
13	25+763	26+397	T	VR			Bandrol	BT	Minor	At-Grade
14	25+860	26+494	T	VR	Malutana	BT			Minor	At-Grade
15	28+835	29+429	+	SH - 52	Narayanpur	BT	Pratapgarh	CC	Major	At-Grade
16	29+330	29+925	T	VR	Heensla	CC			Minor	At-Grade
17	31+200	31+792	T	VR			Saletha	BT	Minor	At-Grade
18	32+565	33+156	T	VR	Dharapur	BT			Minor	At-Grade
19	32+743	33+334	T	VR			Guwara Bhopala	BT	Minor	At-Grade
20	35+650	-	+	MDR	Narayanpur	BT	Pratapgarh	BT	Major	Out of scope due to Thangazhi Bypass
21	37+200	-	T	VR			Pratapgarh	BT	Major	Out of scope due to Thangazhi Bypass
22	38+217	38+214	+	VR	Duhar Chaugan	CC	Duhamala	BT	Minor	At-Grade
23	47+000	46+988	T	VR	Bamanwas Kankar	BT			Minor	At-Grade
24	48+695	48+665	T	SH - 13	Narayanpur	BT			Major	At-Grade
25	48+700	48+650	T	VR	Mundawara	BT			Minor	At-Grade
26	56+630	57+572	T	VR			Bairawas	BT	Minor	At-Grade
27	57+241	58+183	+	VR	Nangalheri	BT	Nangalheri	BT	Minor	At-Grade
28	62+190	63+126	T	MDR			Thana gaji	BT	Major	At-Grade
29	70+020	70+694	T	VR			Malakhera	BT	Minor	At-Grade
30	70+080	70+754	T	VR			Malakhera	BT	Minor	At-Grade
31	70+840	71+517	T	VR	Village	BT			Minor	At-Grade
32	74+150	74+766	T	VR	Akbarpur	CC			Minor	At-Grade
33	74+600	75+215	T	VR			Kherka	BT	Minor	At-Grade
34	75+570	76+182	T	VR			Dhanwala	CC	Minor	At-Grade
35	75+610	76+223	T	VR	Sarska Tiger Camp	CC			Minor	At-Grade

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					Towards	Type	Towards	Type		
Package-II										
1	0+000	-	T	NH - 08	Delhi	BT	Jaipur	BT	Major	No Improvement due to Jogipura Bypass
2	1+700	-	T	VR			Soorpur	BT	Minor	No Improvement due to Jogipura Bypass
3	11+257	-	T	VR			Village	BT	Minor	No improvement due to realignment
4	18+763	-	T	VR	Bijka Hill	BT			Minor	No Improvement due to Viratnagar Bypass
5	19+570	-	+	VR	Market	CC	Ganesh Temple	CC	Minor	No Improvement due to Viratnagar Bypass
6	20+500	-	T	VR			Village	CC	Minor	No Improvement due to Viratnagar Bypass
7	21+940	-	T	VR	Papda	BT			Minor	No Improvement due to Viratnagar Bypass
8	73+050	-	T	VR	Akbarpur	CC			Minor	No improvement due to realignment
9	77+860	-	T	VR			Machri	CC	Minor	No Improvement due to Alwar Bypass
10	79+600	-	T	VR	Siliserh	BT			Minor	No Improvement due to Alwar Bypass

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11	83+370	-	T	SH - 13	Alwar	BT	-101		Major	No Improvement due to Alwar Bypass
12	85+400	-	T	VR			Jaismand lake	BT	Minor	No Improvement due to Alwar Bypass
13	86+165	-	T	ODR	Alwar	BT			Major	No Improvement due to Alwar Bypass
14	87+200	-	T	SH - 25	Alwar	BT			Major	No Improvement due to Alwar Bypass

0.2.10 Proposal of Bridges, Culverts and other Structures

There are one major bridge, 13 minor bridges and 5 Submersible Bridges /vented causeway on the project road. The existing bridges are on natural streams and nallahs. The bridges are without footpath and carriageway width varies from 6.5 m to 11.70 m. Open foundation and Stone masonry wall type substructure is provided for all bridges. Two bridges are with RCC T-Beam and slab type superstructure while others are either stone masonry arch or RCC slab type superstructure.

a) Major & Minor Bridges

The development proposal of existing and new Bridges is given in ***Table 0.8*** and ***Table 0.9*** respectively.

Table 0.8: Proposal for existing Bridges

Sl. No.	Existing Chainage	Design Chainge	Structure Type	Clear span (m)	Proposal	Proposed span, m (Clear)	Proposed structure type	Total width (m)
Package-I								
1	9+093	9+246	Minor Bridge	3x3.7	Reconstruction	1x15.0	RCC T-Beam and slab	16.0
2	-	11+428	-	-	New	1x25.0	PSC Girder and Slab	16.0
3	11+849	11+920	Minor Bridge	1x9.0 (Skew)	Reconstruction	1x15.0	RCC T-Beam and slab	16.0
4	30+674	31+270	Vented Causeway	10x0.9	Reconstruction	1x15.0	RCC T-Beam and slab	16.0
5	37+937	37+933	Minor Bridge	2x 6.8	Widening	2x 6.8	RCC Box	16.0
6	-	73+688	-	-	New	1x30.0	PSC Girder and Slab	16.0

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Sl. No.	Existing Chainage	Design Chainge	Structure Type	Clear span (m)	Proposal	Proposed span, m (Clear)	Proposed structure type	Total width (m)
Package-II								
1	1+030	-	Minor Bridge	5x4.9	Abondoned due to Jogipura Realignment			
2	-	1+645	-	-	New	1x30.0	PSC Girder and Slab	16.0
3	11+365	-	Minor Bridge	1x10.8	Abandoned due to Realignment			
4	18+640	-	Vented Causeway	8x1.2dia	Abandoned due to Viratnagar Bypass			
5	-	18+510	-	-	New	1x15.0	RCC T-Beam and Slab	16.0
6	-	21+842			New	1x10	RCC Box	16.0
7	49+780	-	Minor Bridge	2×10.9+ 1×11.3 (Skew)	Abandoned due to Tal Briksha Bypass			
8	-	51+098	-	-	New	1x15.0	RCC T-Beam and Slab	16.0
9	-	51+549	-	-	New	3x15.0	RCC T-Beam and Slab	16.0
10	56+955	57+897	Vented Causeway	2x6.4+1x5 .9	Reconstruction	1x25.0	PSC Girder	16.0
11	60+788	61+718	Vented Causeway	3x6.4	Reconstruction	2x30.0	PSC Girder	16.0
12	63+847	64+633	Minor Bridge	3x3.0	Retain and Repair			
13	64+290	65+076	Minor Bridge	6x1.6	Reconstruction	1x15.0	RCC T-Beam and slab	16.0
14	64+774	65+531	Major Bridge	2x9.6+ 8x9.8	Widening	2x9.6+8x9.8	RCC Box	16.0
15	68+120	-	Vented Causeway	12x3.0	Abandoned due to Realignment			
16	71+890	72+565	Minor Bridge	6x3.0+ 18x1.0	Reconstruction	3x15.0	RCC T-Beam and slab	16.0
17	72+521	73+196	Minor Bridge	12x2.5	Reconstruction	2x20.0	RCC T-Beam and slab	16.0
18	72+977	-	Minor Bridge	10x1.7	Abandoned due to Realignment			
19	79+264	-	Minor Bridge	3x10.0	Abandoned due to Alawar Bypass			
20	80+570	-	Minor Bridge	3x3.0	Abandoned due to Alawar Bypass			
21	-	79+161	-	-	New	1x15.0	RCC T-Beam and Slab	16.0

b) Proposal of Elevated Structure / Vehicular Underpass (VUP)

The development proposal of Elevated Structure/VUP is given in ***Table 0.10.***

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Table 0.10: Proposal for Elevated Structure/ Flyover/VUPs

Sl. No.	Design Chainage		Length (m)	Span (m)	Structure	Width (m)	Vertical Clearance (m)	Remark
	From	To						
Package - I								
1	18+827		12	1×12	VUP Grade-II*	13	4.0	Viratnagar Bypass
Package - II								
1	35+750		12	1×12	VUP Grade-II*	13	4.0	Thanagazhi Bypass
2	55+160	55+520	360	10×36	Elevated Structure	21.5	5.0	Bairawas
3	56+828	57+800	972	27×36	Elevated Structure	21.5	5.0	Near Nagalheri
4	64+334	64+802	468	13×36	Elevated Structure	21.5	5.0	Near Nagalheri
5	68+700	69+348	648	18×36	Elevated Structure	21.5	5.0	Kushalgarh

Note : As per guidelines given by NHAI vide letter no. 11014/11/2016-HR-1(Policy Matter 10.1.16/2017) dated 12.06.2017

c) Culverts

There are total 121 culverts existing on the project road. Existing culverts are slab, stone masonry arch or pipe culverts having overall width vary from 7.30 m to 34.00 m. Some culverts are choked/buried. The development proposal for culverts is given in **Table 0.11** .

Table 0.11: Development proposal for Culverts

Proposal	Type of Culvert				Total
	Slab	Pipe	Arch	Box	
Package - I					
Retained	0	0	0	0	**0**
Reconstruction	6	21	16	0	**43**
Widening	10	19	0	0	**29**
Abandoned	2	0	2	0	**4**
New	0	1	0	11	**12**
Total	**18**	**41**	**18**	**11**	**88**
Package - II					
Retained	0	2	0	0	**2**
Reconstruction	4	6	3	0	**13**
Widening	16	0	0	0	**16**
Abandoned	7	6	1	0	**14**
New	0	0	0	33	**33**
Total	**27**	**14**	**4**	**33**	**78**

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0.2.11 Toll Plaza

Location of toll plazas has been proposed based on the traffic dispersal pattern at the respective homogenous sections, road geometry and vertical profile of the road and the surrounding area. The location and details of the toll plaza is given in ***Table 0.12***.

Table 0.12: Details of Toll Plaza

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Length (m)	Section
Package - I				
1	4+455	4+520	480m including tapering length	Km 0+000 to 29+500
2	75+994	76+600	480m including tapering length	Km 29+500 to 83+138
Package - II				
			Nil	

0.3 DIVERSION OF PROTECTED AREAS

Exisitng Project road is traversing through Protected Areas-Sariska Tiger Reserve (STR), Alwar from km 51.500 to km 69.536 and km70.600 to km 73.00.

Upgradation of existing road alignment of NH 248A (Shahpura to Alwar) from 2-lane / intermediate lane to 2-lane with paved shoulder configuration has been proposed on the basis of techno-economic and socio-economic feasibility. All possible efforts, to the extent possible, were made to avoid the road through Reserved Forest (RF) and Protected Areas of Sariska Tiger Reserve, Alwar. Proposed improvement of the project road will divert 5.7104ha forest land and acquire 32.1382ha. Non forest land of Sariska Tiger Reserve.

0.4 DIVERSION OF FORESTS LAND

Project road alignment is located in the three forest division Jurisdiction. Forest division jurisdiction wise distribution of project road and proposed diversion of forest land is given below in **Table 0.13**:

Table 0.13: Forest Division wise proposed forest land diversion

Forest Division	Proposed diversion of RF
Jaipur North, Jaipur	7.2436
Sariska Tiger Reserve, Sariska, Alwar	5.7104
Alwar Territory, Alwar	3.1476
Total	**16.1016**

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In addition to Reserve Forest of STR, existing project road is passing through Bilwari RF and Ghata RF. Location of project road in Forest area (other than STR) is given in **Table 0.14**

Table 0.14: Location of Project road in RF areas

From(km)	To(km)	Length(m)	Side	Forest
10.100	10.200	100	RHS	Bilwari RF
12.800	12.900	100		
13.500	15.130	1630	Both side	Bilwari RF
15.130	16.280	1150	LHS	Bilwari RF
16.280	16.500	220	LHS	Bilwari RF
26.000	26.350	Realignment length (300m)	RHS realignment	Ghata RF
26.350	28.275	1925	Both side	Ghata RF
	Total Length	5425m		

0.5 Tree / Plantation

Project road NH-248A(Shapura to Alwar) strip is not declare as Protected Forest. However from km 0.000 to km 33.000 both side of the project road there are tree plantation exists. Therefore tree felling permission is also requested**.**

0.6 NON FOREST LAND ACQUSITION

Proposed widening of project road will involve 114.1343ha acquisition of non-forest land. Project district wise non- forest land to be acquired for the project is presented in **Table 0.15**

Table 0.15: Project District wise Non Forest land Acquisition

District	Non forest land Acquisition (ha.)
Jaipur	46.7221
Alwar	79.4927
Total Area (Ha.)	126.2148

0.7 ARCHEOLOGICAL MONUMENTS

Project road does not affect archeological monuments

0.8 PRELIMINARY COST ESTIMATE

0.8.1 Civil Cost

The project cost on above items has been worked out based on development proposal of the project corridor. The package wise Civil cost of the project road as assessed at this stage is given below:

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Table 0.16: Summary of Cost Estimate (Civil Works) for Construction Package

Sl. No.	Bill No.	Description	Amount (Rs.)	
			Package-I (L=44.274 km)	Package-II (L=38.864 km)
1	Bill No 1	SITE CLEARANCE AND DISMANTLING	3,594,607	6,512,648
2	Bill No 2	EARTH WORK	126,211,996	386,261,757
3	Bill No 3	GRANULAR SUB-BASE AND BASE COURSES	321,591,118	396,826,692
4	Bill No 4	BITUMINOUS COURSES	348,632,148	302,334,602
5	Bill No 5	CROSS DRAINAGE WORKS	38,933,100	43,665,900
6	Bill No 6	BRIDGE'S, UNDERPASS, FLYOVER & ROB ETC.	90,911,200	2,103,096,800
7	Bill No 7	DRAINAGE AND PROTECTIVE WORKS	384,138,585	741,205,018
8	Bill No 8	TRAFFIC SIGNS, MARKINGS AND ROAD APPURTENCES.	164,835,042	171,085,414
9	Bill No 9	MISCELLANEOUS ITEMS	96,240,387	59,333,583
10	Bill No 10	TOLL PLAZA (2 Nos.)	200,000,000	-
TOTAL CIVIL COST			1,775,088,182	4,210,322,414
TOTAL CIVIL COST (in Cr.)			**598.54**	

0.8.2 Total Project cost

The total project cost for on the basis of construction packaging option are given below in **Table 0.17**

Table 0.17: Total Project Cost based on Construction Package

Sl. No.	Description	Amount (in Cr.)		
		Package-I (L=44.274 km)	Package-II (L=38.864 km)	Total
I	Civil Construction Cost (Rs. In Crores)	177.51	421.03	598.54
II	Centages (Rs in Crores)			
1	Contingencies @ 2.8%	4.97	11.79	16.76
2	Construction Supervision @ 2%	3.55	8.42	11.97
3	Administrative Charges @ 1%	1.78	4.21	5.99
4	Quality Control Charges @ 1%	1.78	4.21	5.99
5	Road Safety @ 0.5%	0.89	2.11	3.0
6	Maintenance During DLP @ 5%	8.88	21.05	29.93
7	Escalation during Construction @ 5% per annum	17.76	42.10	59.86
	Total Cost (including Centages)	**217.12**	**514.92**	**732.04**

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Cost of Preconstruction Activities (Rs. in Crores)		
1	Land Acquisition	256.2
2	Utility Shifting (Electrical Overhead & Underground, Water supply, Sewarage, Gas pipe line & OFC) Lump sum	60
	Total Capital Cost (Rs. in Crores)	**1048.3**

Date
Place

(Ajay Kumar Bhupesh)
Executive Engineer
PWD, NH, Division-I
Jaipur

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