CHAPTER – 0

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1 GENERAL

The Ministry of Road Transport and Highways(MoRTH) has been entrusted with the assignment of Consultancy Services for feasibility study and preparation of Detailed Project Report for improvement and up-gradation of in principle declared National Highways in the State of Utter Pradesh for Two/Four lane with paved shoulder configuration.

MoRTH now invites proposal from Technical consultants for carrying out detailed project report for proper structuring and implementation of projects on EPC/PPP mode of **Padrauna-Tamkuhiraj** Road in the State of Utter Pradesh.

In order to fulfill the traffic needs and road safety requirement, MoRTH has appointed the M/s HIGHWAY ENGINEERING CONSULTANT as consultants to Providing Consultancy Services for feasibility study and preparation of Detailed Project Report of **Padrauna-Tamkuhiraj road** in the State of Utter Pradesh for up-gradation to Two Lanes with paved shoulder /Four lane configurations, the assignment for **package no.-X.**

The road is taken into consideration in one section:

I. Section: Padrauna-Tamkuhiraj Road (TOR length Km 37.100) (Design Length –37.470).

2 OBJECTIVES

- The main objective of the consultancy service is to establish the technical, economical, and financial viability of the project and prepare detailed project reports for rehabilitation and upgrading of the existing road to 2/4 lane configuration.

- The viability of the project shall be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on highway design, pavement design, provision of service roads wherever necessary, type of intersections, rehabilitation and widening of existing and/or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates and economic analysis.

- The Detailed Project Report would inter-alia include detailed highway design, design of pavement and overlay with options for flexible or rigid pavements, design of bridges and cross drainage structures and grade separated structures, design of service roads, quantities of various items, detailed working drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for international / local competitive bidding.

- The DPR consultant should ensure detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation.

3 SCOPE OF SERVICES

The scope of consultancy services includes:

- Engineering Surveys and Investigations.

- Highway Design.
- Environmental Impact Assessment.
- Estimation of Project Cost.
- Economic Analysis.
- Preparation of Feasibility study Report and Detailed Project Report.
- Submission of Deliverables.

4 APPROACH AND METHODOLOGY

The consultant's approach towards the approach is in accordance to the TOR in lines with the project objectives. The prescribed engineering surveys and investigations have been carried out on the Project Road conforming to MORTH/IRC/BIS Specifications/Codes as per TOR to generate adequate database for preparing the most proposal for the rehabilitation and upgrading of the existing National Highway.

5 START AND END POINT

The project road is Padrauna – Tamkuhiraj. The Project road starts at Katkuhiya junction at Ch. 564+750 of NH 730 in Padrauna city and end at Tamkuhiraj junction at Ch 352+600 of NH-28.The project road falls in Kushinagar district (U.P).

6 TERRAIN

The project road passes through plain terrain.

7 REFERENCING SYSTEM

Along the existing road, Kilometer stones exist in entire length of the project highway and thereby called the "Existing Chainage".

8 ROAD INVENTORY

The project corridor traverses mostly through plain terrain. The land use is predominantly agricultural with intermittent built up areas. The single/ two lane carriageway is having a width of 3.75-7.0 m. The earthen shoulder width generally varies from1.0-2.0 m on either side. The type of shoulder is earthen or hard excluding the urban areas. The details of existing carriageway width are given in Table E-1.

Table E-1: Details of Existing Carriageway Width

S. No.	Existing Chainage		Length (Km)	Carriageway	
	Km	Km		Type	Width (m)
1	0	1	1	B.T	7
2	1	2	1	B.T	7
3	2	3	1	B.T	7
4	3	4	1	B.T	7
5	4	5	1	B.T	7
6	5	6	1	B.T	7
7	6	7	1	B.T	7
8	7	8	1	B.T	7
9	8	9	1	B.T	7
10	9	10	1	B.T	7
11	10	11	1	B.T	7
12	11	12	1	B.T	3.75
13	12	13	1	B.T	3.75
14	13	14	1	B.T	3.75
15	14	15	1	B.T	3.75
16	15	16	1	B.T	3.75
17	16	17	1	B.T	3.75
18	17	18	1	B.T	3.75
19	18	19	1	B.T	3.75
20	19	20	1	B.T	3.75
21	20	21	1	B.T	3.75
22	21	22	1	B.T	3.75
23	22	23	1	B.T	3.75
24	23	24	1	B.T	3.75
25	24	25	1	B.T	3.75
26	25	26	1	B.T	3.75
27	26	27	1	B.T	3.75
28	27	28	1	B.T	3.75
29	28	29	1	B.T	3.75
30	29	30	1	B.T	3.75
31	30	31	1	B.T	3.75
32	31	32	1	B.T	3.75
33	32	33	1	B.T	3.75
34	33	34	1	B.T	3.75
35	34	35	1	B.T	3.75
36	35	36	1	B.T	3.75

S. No.	Existing Chainage		Length (Km)	Carriageway	
	Km	Km		Type	Width (m)
37	36	37	1	B.T	3.75
38	37	37.470	0.47	B.T	3.75

***B.T –Bituminous, GR – Gravel, U/G-Under Construction ER- Earthen, CC-Cement Concrete**

9 GEOMETRICS

In the following sections, where improvement of the existing road geometrics to the prescribed standards is not possible, the existing road geometrics shall be improved to the extent possible within the given right of way and proper road signs and safety measures shall be provided for safe regulation of fast moving, slow moving and pedestrian traffic. The details of the locations having poor geometric characteristics are given in Table E-4.

Table E-4: Locations of poor road geometry

Sl. No.	Stretch/Design Chainages (from km to km)	Type of deficiency		Remarks
		Radius of curve	Design Speed	
1				
2				

10 ROAD CROSSINGS / JUNCTIONS

There are 3 numbers of major junctions along the project section of the project road and 121 minor junctions. The approach roads are basically feeder roads connecting to villages, agricultural fields and factories along the project road. Mostly these are WBM roads. Rest of the intersections is of lower significance with local roads in urban settlements, village roads and earthen roads. The lists of major junctions are presented in Table E-5below.

Table E-5: List of Existing Major Junctions

S. No	CHAINAGE		TYPE	SIDE		MAJOR / MINOR	VILLAGE
	EXISTING	DESIGN		LHS	RHS		
1	0+000	565.272	T	LHS	RHS	MAJOR	PADRAUNA TOWN
2	32+400	597.672	X	LHS	RHS	MAJOR	BANRAHA VILLAGE
3	37+000	602.272	T	LHS	RHS	MAJOR	TAMKUHIRAJ TOWN

The lists of junctions with secondary importance are presented in Table E-6.

Table E-6: List of Existing Junctions with Secondary Importance

S. No	CHAINAGE		TYPE	SIDE		MAJOR / MINOR
	EXISTING	DESIGN		LHS	RHS	
1	0.600	565.350	T	LHS		MINOR
2	0.75	565.500	T		RHS	MINOR
3	1.532	566.282	T		RHS	MINOR
4	1.862	566.612	T		RHS	MINOR
5	2.162	566.912	Y	LHS		MINOR
6	2.172	566.922	Y		RHS	MINOR
7	2.242	566.992	Y	LHS		MINOR
8	2.372	567.122	T	LHS		MINOR
9	3.852	568.602	T	LHS		MINOR
10	4.122	568.872	T		RHS	MINOR
11	5.262	570.012	T	LHS		MINOR
12	4.602	569.352	T	LHS	RHS	MINOR
13	4.982	569.732	T		RHS	MINOR
14	5.122	569.872	T	LHS		MINOR
15	5.622	570.372	T	LHS		MINOR
16	5.902	570.652	T	LHS		MINOR
17	6.022	570.772	T	LHS		MINOR
18	6.192	570.942	T		RHS	MINOR
19	6.602	571.352	T		RHS	MINOR
20	6.952	571.702	T		RHS	MINOR
21	6.982	571.732	T	LHS		MINOR
22	7.212	571.962	T		RHS	MINOR
23	7.432	572.182	T		RHS	MINOR
24	7.532	572.282	T		RHS	MINOR
25	7.692	572.442	T	LHS	RHS	MINOR

S. No	CHAINAGE		TYPE	SIDE		MAJOR / MINOR
	EXISTING	DESIGN		LHS	RHS	
26	8.792	573.542	T		RHS	MINOR
27	8.842	573.592	T	LHS	RHS	MINOR
28	9.092	573.842	T	LHS	RHS	MINOR
29	9.182	573.932	T		RHS	MINOR
30	9.282	574.032	T	LHS		MINOR
31	9.342	574.092	T		RHS	MINOR
32	9.492	574.242	T	LHS	RHS	MINOR
33	9.802	574.552	T	LHS		MINOR
34	9.962	574.712	T	LHS		MINOR
35	9.982	574.732	T	LHS		MINOR
36	10.142	574.892	T	LHS		MINOR
37	10.232	574.982			RHS	MINOR
38	11.252	576.002	T		RHS	MINOR
39	11.372	576.122	T	LHS		MINOR
40	11.432	576.182	T		RHS	MINOR
41	11.712	576.462	T	LHS		MINOR
42	12.002	576.752	T	LHS		MINOR
43	12.072	576.822	T		RHS	MINOR
44	12.582	577.332	T	LHS		MINOR
45	12.782	577.532	T		RHS	MINOR
46	12.832	577.582	T		RHS	MINOR
47	13.002	577.752	T	LHS		MINOR
48	13.172	577.922	T	LHS		MINOR
49	13.322	578.072	T	LHS	RHS	MINOR
50	13.442	578.192	T		RHS	MINOR
51	13.912	578.662	T		RHS	MINOR
52	14.252	579.002	T		RHS	MINOR
53	14.312	579.062	Y	LHS	RHS	MINOR
54	14.512	579.262	Y	LHS		MINOR
55	14.792	579.542	Y	LHS		MINOR
56	15.202	579.952	Y	LHS		MINOR
57	17.062	581.812	Y	LHS		MINOR
58	17.082	581.832	Y		RHS	MINOR
59	17.772	582.522	Y	LHS		MINOR
60	17.812	582.562	Y	LHS		MINOR
61	18.702	583.452	T	LHS		MINOR
62	18.952	583.702	T		RHS	MINOR
63	19.082	583.832	T	LHS		MINOR
64	19.302	584.052	Y		RHS	MINOR

S. No	CHAINAGE		TYPE	SIDE		MAJOR / MINOR
	EXISTING	DESIGN		LHS	RHS	
65	20.672	585.422	Y		RHS	MINOR
66	20.742	585.492	T	LHS		MINOR
67	20.942	585.692	Y		RHS	MINOR
68	20.962	585.712	Y		RHS	MINOR
69	21.642	586.392	Y	LHS		MINOR
70	21.712	586.462	T	LHS		MINOR
71	21.952	586.702	Y	LHS		MINOR
72	22.302	587.052	T		RHS	MINOR
73	22.312	587.062	T	LHS		MINOR
74	22.362	587.112	T		RHS	MINOR
75	22.742	587.492	T	LHS	RHS	MINOR
76	22.852	587.602	T	LHS	RHS	MINOR
77	23.122	587.872	T		RHS	MINOR
78	23.142	587.892	T	LHS		MINOR
79	23.212	587.962	T		RHS	MINOR
80	23.272	588.022	T		RHS	MINOR
81	23.522	588.272	T	LHS		MINOR
82	23.572	588.322	T		RHS	MINOR
83	24.192	588.942	T		RHS	MINOR
84	24.282	589.032	T	LHS		MINOR
85	24.602	589.352	T		RHS	MINOR
86	24.912	589.662	T	LHS		MINOR
87	25.132	589.882	T	LHS		MINOR
88	25.142	589.892	T		RHS	MINOR
89	25.522	590.272	T	LHS		MINOR
90	25.822	590.572	T		RHS	MINOR
91	26.122	590.872	T		RHS	MINOR
92	26.292	591.042	T		RHS	MINOR
93	26.472	591.222	T	LHS		MINOR
94	26.792	591.542	T	LHS		MINOR
95	26.852	591.602	T	LHS		MINOR
96	27.302	592.052	Y		RHS	MINOR
97	28.402	593.152	T		RHS	MINOR
98	28.792	593.542	Y		RHS	MINOR
99	29.002	593.752	T	LHS		MINOR
100	29.472	594.222	T		RHS	MINOR
101	30.342	595.092	T		RHS	MINOR
102	30.722	595.472	Y	LHS		MINOR
103	30.832	595.582	T		RHS	MINOR

S. No	CHAINAGE		TYPE	SIDE		MAJOR / MINOR
	EXISTING	DESIGN		LHS	RHS	
104	31.062	595.812	T		RHS	MINOR
105	31.822	596.572	T	LHS	RHS	MINOR
106	32.252	597.002	T	LHS	RHS	MINOR
107	33.472	598.222	Y		RHS	MINOR
108	34.012	598.762	T		RHS	MINOR
109	34.202	598.952	T	LHS		MINOR
110	34.502	599.252	T	LHS		MINOR
111	35.072	599.822	Y	RHS		MINOR
112	35.762	600.512	T	LHS		MINOR
113	35.922	600.672	T	LHS	RHS	MINOR
114	36.142	600.892	T & Y	LHS		MINOR
115	36.562	601.312	T	LHS		MINOR
116	36.722	601.472	Y		RHS	MINOR
117	36.832	601.582	T	LHS		MINOR
118	37.222	601.972	Y		RHS	MINOR
119	37.302	602.052	T		RHS	MINOR
120	37.352	602.102	T	LHS		MINOR

12 RAILWAY CROSSINGS

There are two Existing level Crossings along the project road:

i) At Design Ch. 568+350 with L.C. No. 64-B/E-2

ii) At Design Ch. 595+160 with L.C. No.40-B/E-2

11 CROSS DRAINAGE STRUCTURES

Detailed inventory and condition survey was carried out along the project stretch, during which 39 existing culverts, 6 Minor bridges and 02 Level Crossing were observed as existing Structures to cater for drains, streams & rivers. The proposed structures and rehabilitation scheme for existing structures proposed to be retained has been finalized based on detailed inventory, Horizontal Alignment, Geotechnical investigation, Hydrological study etc

The total number of structure on the site is given in below table-

Details of Existing Cross Drainage Structures

Sr. No.	Details	Total Nos.

1	No. of Major Bridge	Nil
2	No. of ROB	Nil
3	No. of Flyover	Nil
4	No. of Minor Bridge	06
5	No. of Vehicular and Non Vehicular Underpasses/VOP	Nil
6	No. of Box Culverts	Nil
7	No. of Slab Culverts	10
8	No. of Arch Culverts	26
9	No. of Pipe Culverts	03

Details of Existing Bridges:

MAJOR BRIDGES: -

There is no Major Bridge along the Project Road

MINOR BRIDGES: - 06 Nos.

There are 06 existing Minor Bridges lying on the project stretch. The types of superstructures for the Minor Bridges were found to be RCC Solid Slab & RCC Girder type superstructures resting on Brick Masonry Sub-Structure. Some common distresses were observed such as exposed and corroded reinforcement in slabs; spalling of concrete, damaged/missing railing and growth of vegetation on pier caps and in vent ways, damaged wearing coat, damaged expansion joints & settlement of embankment around abutments etc. All Bridges are high level Bridges.

Flow Chart for Existing Culverts

Details of Existing Culverts:

The similar procedures were adopted for the inventory and condition surveys for cross-drainage structures as per guidelines stipulated in IRC-SP: 19-2001. The existing culverts observed along the project road are mainly of four types viz. RCC Slab culverts, Pipe culverts, Arch type culverts and Causeways (Flush). The structural condition of pipe culvert is generally fair, except few partially choked or buried culverts due to heavy vegetation. Most of the slab culverts are in poor condition. Some common distresses observed were damaged parapets, cracked/ damaged headwalls, abutments and return walls, corroded exposed reinforcement, insufficient waterway etc.

1 Traffic Survey Schedule

Location (Existing Chainage)	Date of Traffic Survey		Duration
	From	To	
Classified Traffic Volume Count			
2+000	19.05.17	25.05.17	7 Days / 24 Hours
10+000	20.05.17	26.05.17	7 Days / 24 Hours
37+000	20.05.17	26.05.17	7 Days / 24 Hours
Axle load Survey			
22+000	20.05.17	21.05.17	24 Hours

2 PROPOSED BYPASSES

NIL

3 PROPOSED SERVICE ROAD

NIL

4 PROPOSED PAVEMENT COMPOSITION

The summary of the crust is as given below:

- **For TCS-3, TCS-4, TCS-5,TCS-6**

Flexible Pavement	
BC	50 mm
AGL	100 mm
CTB	210 mm
GSB	250 mm
Subgrade	500 mm

- **For TCS-1, TCS-2**

Flexible Pavement	
BC	40 mm
DBM	50 mm
WMM	250 mm
GSB	250 mm
Subgrade	500 mm

5 PROPOSED STRUCTURES

Cross-Drainage (Bridges & Culverts)

IMPROVEMENT PROPOSALS FOR BRIDGES

As per the proposed Alignment along the Project Stretch **01** Minor Bridge at Proposed Ch. 596+270 is proposed as New Construction with span arrangement (2 x 30.0m) due to realignment. **Due to this Realignment 02 Minor Bridges which are in poor condition at Ex. Ch. 31+270 and 31+425 having span arrangement (3 x 3.45m) and (3 x 9.0m) respectively have been abandoned**. 03 Minor bridges are recommended for New Construction parallel to the existing Bridge which are in fair condition and **01** Minor Bridge is recommended for concentric widening. All Minor Bridges have been proposed for two lane configurations as per applicable manual of specifications (i.e. IRC: SP: 73-2015).

Summary of Proposed Bridges

IMPROVEMENT PROPOSALS FOR EXISTING CULVERTS

43 culverts are proposed along the project road. The improvement proposals for existing culverts are proposed for 2-lane carriageway & 4 lane for built up sections (as per the Manual of Specifications). There are 32 existing culverts which are recommended for reconstruction (4 slab type, 26 arch types and 02 pipe culvert). These culverts observed along the project road are mainly of poor condition, inadequate waterway and has been recommended for reconstruction. Those culverts which are found to be in fair condition with 0.9 m dia or more are recommended for widening w.r.t. Schedule of TCS.

Details of Proposed Culverts

[illegible] due to Realignment. 04 No

Crossing:

There are two Existing level Crossings along the project road at proposed Ch. 568+350 with L.C. No. 64-B/E-2 and at proposed Ch. 595+160 with L.C. No. 40-B/E-2.

ROBs have been proposed on the both Level Crossings which details are tabulated below.

S. No.	Existing Ch. (Km)	Proposed Ch. (Km.)	Remark	Proposed ROB's Span Arrangement	Proposed Type of Structure	Proposed Width (m)
1	2+600	568+350	Level Crossing	1X20.0+1X60.0+1X20.0	ROB	16.0
2	30+100	595+160	Level Crossing	1X15.0+1X60.0+1X15.0	ROB	16.0

PROPOSED FACILITIES

I. TOLL PLAZA:

As per the tolling policy under Gazette notification dated 5.12.2008, the minimum distance between two toll plazas shall be 60 km. In the present case, the toll plaza exists on NH 28 is at Ch. 361+902 under Salemgarh town, however the proposed alignment is merging with NH 28 at Ch. 352+600, which is just 9.3 km before the existing toll plaza. The length of proposed alignment under NH 730 is 37.47 km (Ch. 564+750 to Ch. 602+220). it implies that even from the starting point of the proposed alignment, the toll plaza exists at a distance of 46.77 km, which is approx. 14 km short for providing a toll plaza on this proposed alignment. Accordingly, in light of the provisions under circular dated 5.12.2008, **new toll plaza has not been proposed for the stretch from Ch. 564 + 750 to Ch. 602+220 of NH 730**. The information of toll plaza at Ch. 361+902 is as follows:

NATIONAL HIGHWAYS AUTHORITY OF INDIA TOLL INFORMATION SYSTEM (index.aspx?language=en)

Toll Plaza Information

Toll Plaza Information

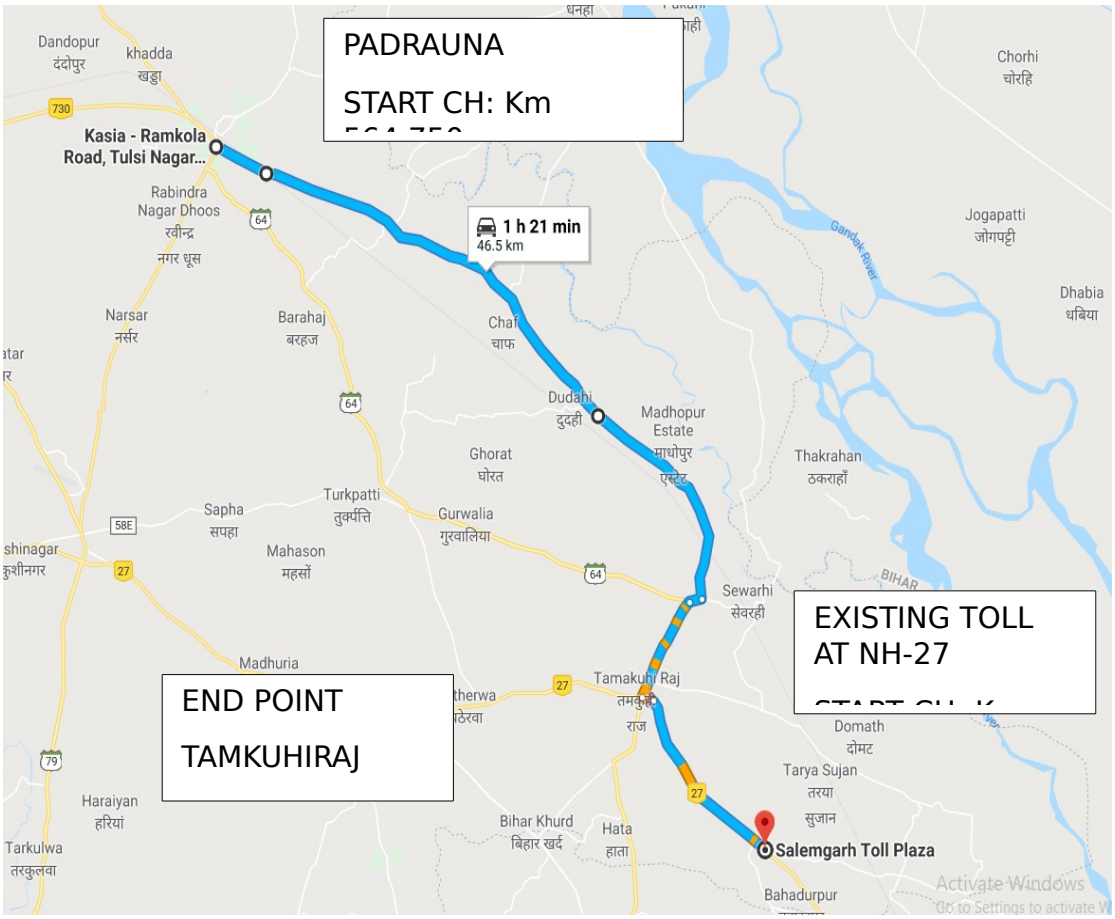
Salemgarh (OMT)
Km 361.902 - **NH-28 in Uttar Pradesh**
Stretch : UP/ Bihar Border - Kasia
Tollable Length : 46.000 Km(s)

Fee Effective Date : 01-Apr-2017 / **Due date of toll revision :** 31-Mar-2018

Type of vehicle	Single Journey	Return Journey	Monthly Pass	Commercial Vehicle Registered within the district of plaza
Car/Jeep/Van	45.00	70.00	1515.00	25.00
LCV	75.00	110.00	2445.00	35.00
Bus/Truck	155.00	230.00	5120.00	75.00
Upto 3 Axle Vehicle	170.00	250.00	5585.00	85.00
4 to 6 Axle	240.00	360.00	8030.00	120.00
HCM/EME	240.00	360.00	8030.00	120.00
7 or more Axle	295.00	440.00	9775.00	145.00

Date of fee notification	22-May-2012 (Sr No. - S.O. 1154 (E))
Commercial Operation Date	16-Dec-2012
Fee Rule	2008 as amended

The detailed map of the same is as follows:



II. BUS SHELTER & BUS-BAYS WITH SHELTER:

Bus Bays shall be provided at following locations conforming to section 12 of manual of specifications and standards. Bus shelters are provided in the following locations.

Sr. No	Existing Km	Chainage	Side
1	0.150	564.90	Both side
2	2.300	567.05	Both side
3	5.050	569.80	Both side
4	12.100	576.85	Both side

Sr. No	Existing Km	Chainage	Side
5	15.750	580.50	Both side
6	19.950	584.70	Both side
7	22.000	586.75	Both side
8	24.900	589.65	Both side
9	26.900	591.65	Both side
10	29.350	593.60	Both side
11	31.150	595.40	Both side
12	32.650	597.40	Both side
13	36.525	600.40	Both side
14	37.400	602.15	Both side

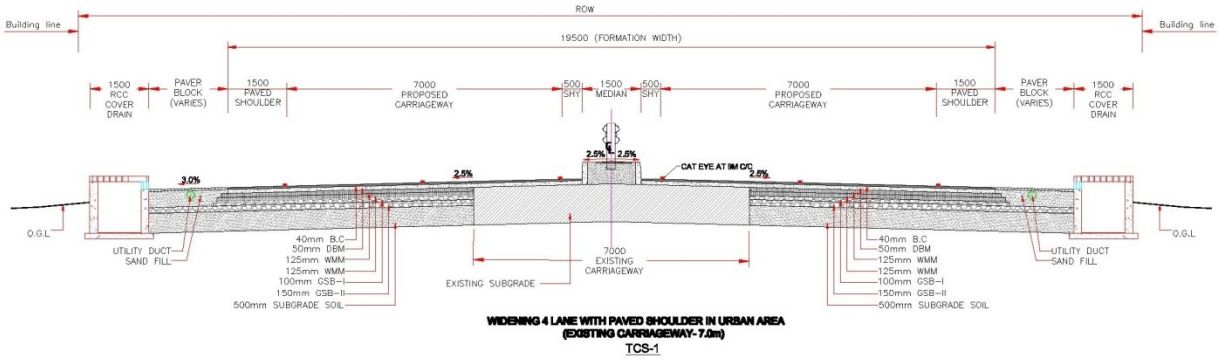
III. TRUCK LAY BYE:

S. No	Existing Chainage	Proposed
1.	6+900	571.650

IV. HIGHWAY LIGHTING: Street lighting and lighting system shall be provided in accordance with Clause 12.4, Section 12 of the Manual of Specifications and Standards mentioned in Schedule D.

V. SAFETY BARRIERS: Safety barriers ("W" beam type) shall be provided as per manual, relevant IRC codes and MoRT&H specifications.

TYPICAL CROSS SECTION

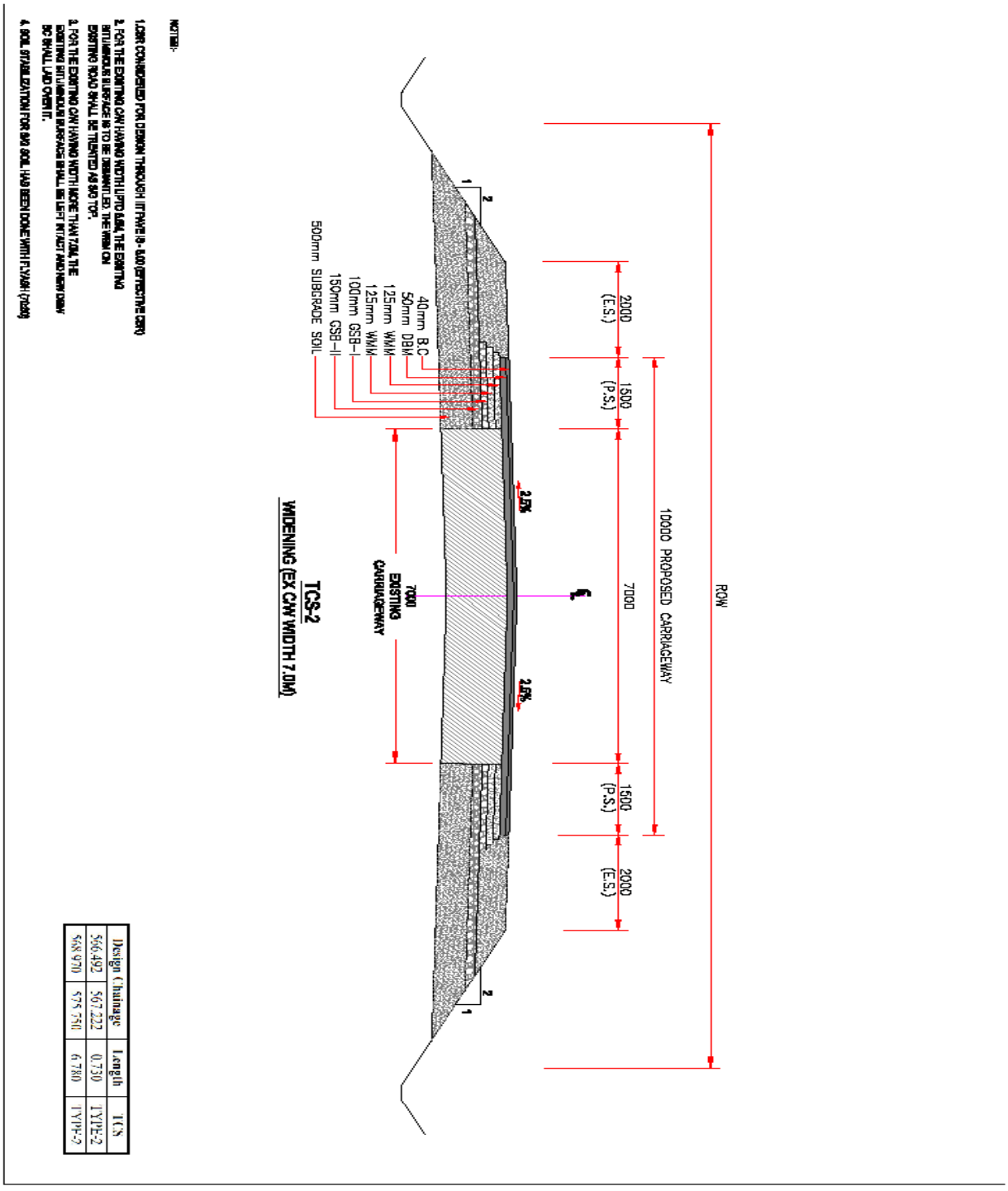


WIDENING 4 LANE WITH PAVED SHOULDER IN URBAN AREA
(EXISTING CARRIAGEWAY- 7.0m)
TCS-1

NOTES:-

1. CBR CONSIDERED FOR DESIGN THROUGH IIT PAVE IS - 8.00 (EFFECTIVE CBR)
2. FOR THE EXISTING C/W HAVING WIDTH UPTO 5.5M, THE EXISTING BITUMINOUS SURFACE IS TO BE DISMANTLED. THE WBM ON EXISTING ROAD SHALL BE TREATED AS S/G TOP.
3. FOR THE EXISTING C/W HAVING WIDTH MORE THAN 7.0M, THE EXISTING BITUMINOUS SURFACE SHALL BE LEFT INTACT AND NEW DBM/ BC SHALL LAID OVER IT.
4. SOIL STABILIZATION FOR S/G SOIL HAS BEEN DONE WITH FLYASH (70:30)

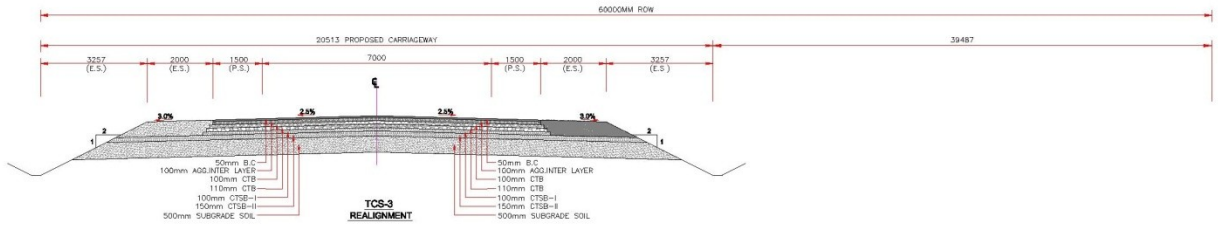
Design Chainage		Length	TCS
564.750	566.492	1.742	TYPE-1



Design Chainage	Length	TCS
566.492	0.730	TYPE-2
567.222	6.780	TYPE-2
574.750		
568.970		

NOTES:-

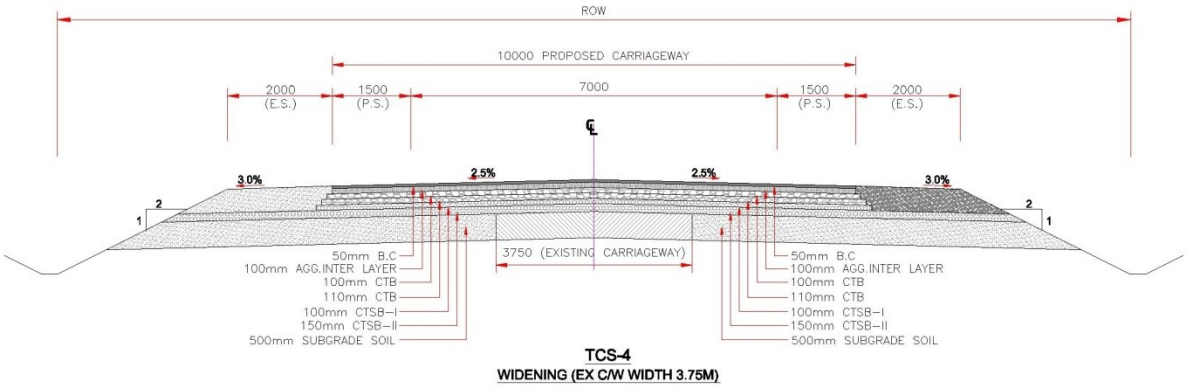
1. CBR CONSIDERED FOR DESIGN THROUGH IITPAVE IS - 8.00 (EFFECTIVE CBR)
2. FOR THE EXISTING C/W HAVING WIDTH UPTO 4.0M, THE EXISTING BITUMINOUS SURFACE IS TO BE DREMMOLED. THE WMM ON EXISTING ROAD SHALL BE TREATED AS SUB TOP.
3. FOR THE EXISTING C/W HAVING WIDTH MORE THAN 7.0M, THE EXISTING BITUMINOUS SURFACE SHALL BE LEFT INTACT AND NEW DBM/ BC SHALL LAID OVER IT.
4. SOIL STABILIZATION FOR 8% SOIL HAS BEEN DONE WITH FLYASH (25%)



NOTES:-

1. CBR CONSIDERED FOR DESIGN THROUGH IIT PAVE IS - 8.00 (EFFECTIVE CBR)
2. FOR THE EXISTING C/W HAVING WIDTH UPTO 5.5M, THE EXISTING BITUMINOUS SURFACE IS TO BE DISMANTLED. THE WBM ON EXISTING ROAD SHALL BE TREATED AS S/G TOP.
3. FOR THE EXISTING C/W HAVING WIDTH MORE THAN 7.0M, THE EXISTING BITUMINOUS SURFACE SHALL BE LEFT INTACT AND NEW DBM/ BC SHALL LAID OVER IT.
4. SOIL STABILIZATION FOR S/G SOIL HAS BEEN DONE WITH FLYASH (70:30)

Design Chainage		Length	TCS
567.222	567.790	0.568	TYPE-3
596.072	596.982	0.910	TYPE-3

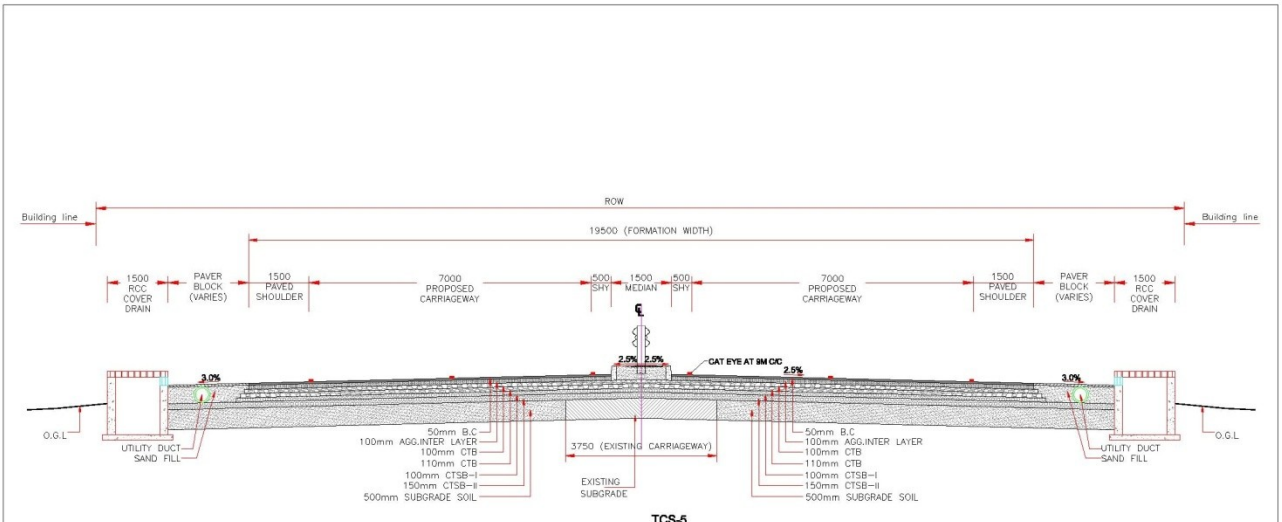


TCS-4
WIDENING (EX C/W WIDTH 3.75M)

NOTES:-

1. CBR CONSIDERED FOR DESIGN THROUGH IIT PAVE IS - 8.00 (EFFECTIVE CBR)
2. FOR THE EXISTING C/W HAVING WIDTH UPTO 5.5M, THE EXISTING BITUMINOUS SURFACE IS TO BE DISMANTLED. THE WBM ON EXISTING ROAD SHALL BE TREATED AS S/G TOP.
3. FOR THE EXISTING C/W HAVING WIDTH MORE THAN 7.0M, THE EXISTING BITUMINOUS SURFACE SHALL BE LEFT INTACT AND NEW DBM/ BC SHALL LAID OVER IT.
4. SOIL STABILIZATION FOR S/G SOIL HAS BEEN DONE WITH FLYASH (70:30)

Design Chainage		Length	TCS
575.750	584.722	8.972	TYPE-4
587.322	594.660	7.338	TYPE-4
595.720	596.072	0.352	TYPE-4
596.982	597.422	0.440	TYPE-4



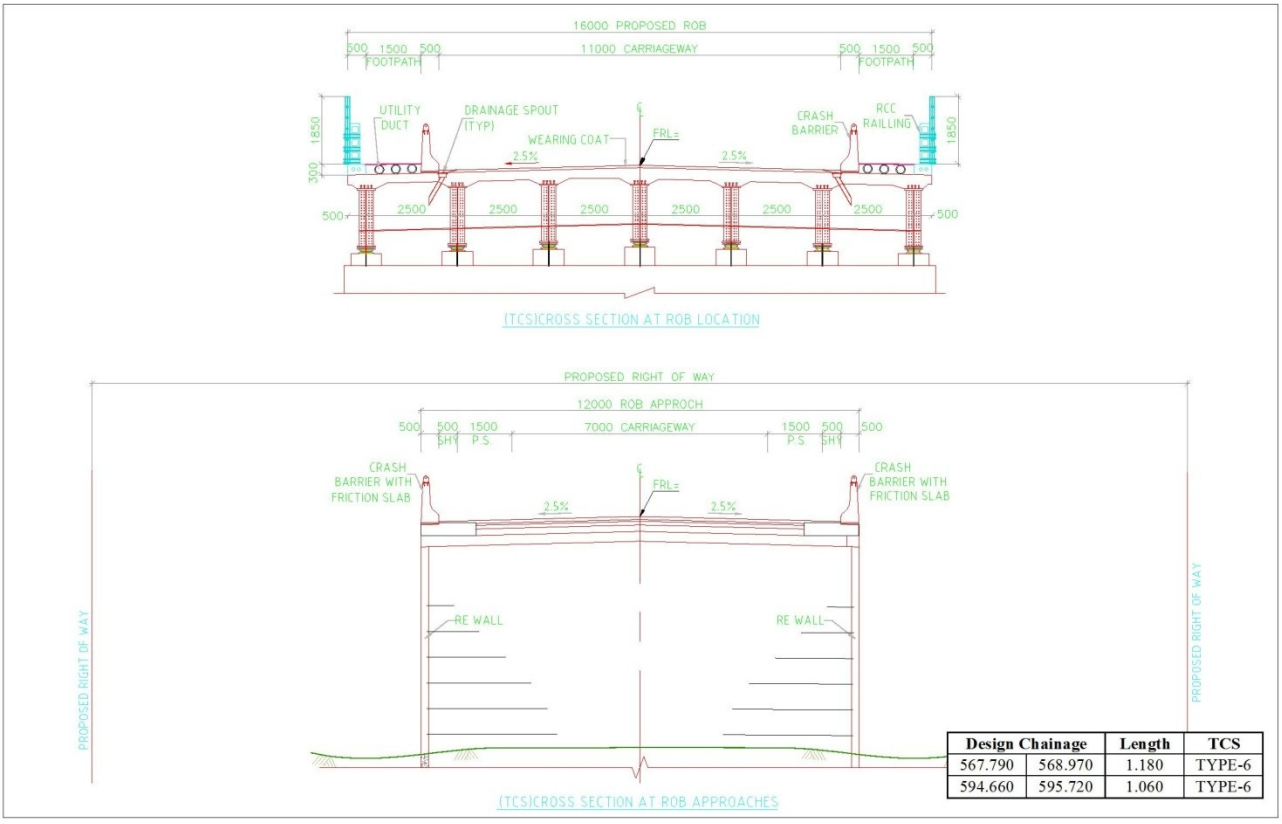
TCS-5

WIDENING 4 LANE WITH PAVED SHOULDER IN URBAN AREA (EXISTING CARRIAGEWAY- 3.75m)

NOTES:-

1. CBR CONSIDERED FOR DESIGN THROUGH IIT PAVE IS - 8.00 (EFFECTIVE CBR)
2. FOR THE EXISTING C/W HAVING WIDTH UPTO 5.5M, THE EXISTING BITUMINOUS SURFACE IS TO BE DISMANTLED. THE WBM ON EXISTING ROAD SHALL BE TREATED AS S/G TOP.
3. FOR THE EXISTING C/W HAVING WIDTH MORE THAN 7.0M, THE EXISTING BITUMINOUS SURFACE SHALL BE LEFT INTACT AND NEW DBM/ BC SHALL LAID OVER IT.
4. SOIL STABILIZATION FOR S/G SOIL HAS BEEN DONE WITH FLYASH (70:30)
5. UTILITY DUCT OF 300 Ø IS TO BE PROVIDED @ EVERY 100M INTERVAL NEAR TO STREET LIGHT POLE FOR CROSSING OF CABLES.

Design Chainage		Length	TCS
584.722	587.322	2.600	TYPE-5
597.422	602.222	4.800	TYPE-5



Design Chainage		Length	TCS
567.790	568.970	1.180	TYPE-6
594.660	595.720	1.060	TYPE-6